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DENTAL LABORATORY

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

Continued from page 95, No. 4, Vol. 2.

The great secret of soldering is even-heating, gradual heating, thorough heating and close fitting. It is often found that (as for instance in soldering a clasp to a plate) though the clasp may fit the tooth ever so perfectly, and though the plate may fit around the clasp ever so accurately, that after the two have been soldered, the clasp will stand away from the tooth, or the plate sprung away from the investment. The disposition of all young workmen is to get the case soldered *as soon as possible*, and to this is due the error which is certain to occur if it is attempted to make the solder flow before the case has been *slowly*, *evenly* and *thoroughly* heated. The investment and plate should both be glowing red hot; not so hot, of course as to endanger the melting of the plate, but still the whole work so hot that the solder is almost ready to fuse before the flame is thrown on it. The flame should not be directed against the plate until all has been heated glowing red hot by the conduction of the heat *through* the investment. If the flame is thrown on the plate, *uneven* heat will be exerted, and the plate will warp, or the clasp drawn away from the investment, and in this case there is nothing to do but to saw off the clasp, readjust the plate, which is often extremely difficult, file off the solder, wax on the clasp again with adhesive wax or shellac, reinvest and resolder. In heating up a case then, never throw the flame *on the plate* until all the work has been heated red hot *through the investment.* Blow on the investment constantly until clasps, teeth, backings, and plate are so hot that it will only require a momentary blast, with the flame pointed, to have all the solder melt evenly where it is wanted. Another great aid in soldering is *the close fitting* of the parts. It is needless to expect the solder to *bridge over spaces* that have been badly fitted. To this cause is due the drawing away of clasps from the investment as much as irregular heating, not to speak of the greater difficulty of making the solder flow over such badly fitted

joints. It is a source too, of warpage; for as more solder than is necessary is used to bridge these places, the shrinkage, when the solder cools, must draw the softer or more yielding metal, of which the plate is made, out of place. When spaces exist between the backings of the teeth and the plate from bad fitting or any accidental cause, it is best to fill these spaces with gold foil by packing them full, so that the solder may flow over these places without difficulty.

The plate being swedged the teeth are then ground and fitted to it. To do this a rim of wax is placed over the plate and the tooth put in the position it is to occupy on this wax according as the position is indicated by the bite on the articulator. The tooth is then ground to fit against the plate in its proper position by means of *small corundum wheels* attached to the spindle of *the grinding and polishing lathe.* These corundum wheels cut better if they are kept well moistened while they are revolved in the lathe, and for this purpose *a lathe drip* is a convenient and necessary adjunct to this part of the work. We know of no better arrangement that may be made for this purpose than an old "Student's Lamp." The part that holds the wick on chimney is readily filed off, when a small faucet can be soldered to the tube at the point cut off, and thus the flow is easily regulated and made to drip on the sponge against which the wheel turns. These old Lamps may be readily had at any second hand dealer's or auction for a very nominal cost. Fig. 24 illustrates the device. The drip being placed on the table of the lathe the faucet is turned and the water flows from the tank A, in such volume as it is needed.

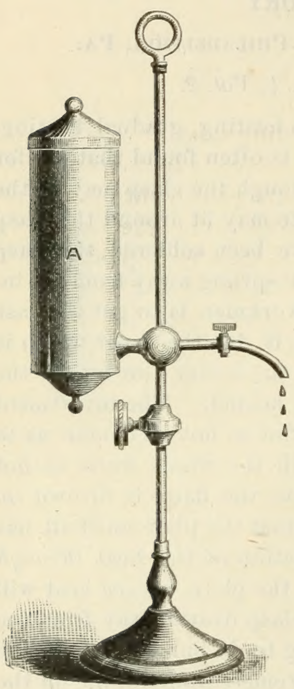


Fig. 24.

A square pan, preferably made of sheet zinc, is laid on the table beneath the grinding wheels to catch the dripping from the faucet. This should be about 6 or 7 inches square by one or one and a half inches deep. A piece of board, a half inch thick may rest on this pan to afford a support or rest for the hand while holding the tooth to be ground or fitted. If the water is permitted to drip directly on the stone it is thrown off by the revolution of the wheel and splashed in the face or over the clothing. To avoid this the wheel should

turn against a piece of sponge. We have tried many devices for this purpose, but the one that we have settled on gives the most satisfaction and is easily made. Procure an old iron *three-pronged fork.* Remove the bone or wood handle from it. Fill a large casting ring full of moulding sand. Let this be packed in tight. Now take the *prong part* of the fork and sink it into the moulding sand below the part where the prongs diverge from the shank. Level off the sand with a spatula and place a small casting ring over that part of the fork

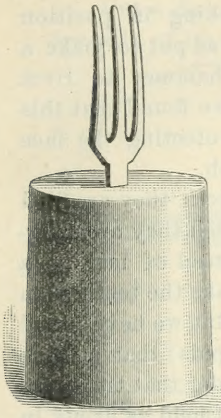


Fig. 25.

that sticks out of the sand. This small casting ring should be placed in this position *inverted* so that the small part of it will be next the mouldings and in the large ring. The edges of this small casting ring are then filled around the outside with moulding sand, to prevent the escape of the metal which is to be poured in. Lead is then melted and poured into the small casting ring. This flows around the shank and holds it fast. When it cools an appliance such as is shown in Fig. 25, is the result. A piece of sponge is readily stuck on the fork and the weight of the lead base which is cast around it not only holds it steady against the revolving wheel, but materially steadies the light sheet zinc pan into which the dripping water falls.

The teeth being all ground and fitted to the plate, it is our custom to make a plaster matrix to hold them in position. This is done by countersinking several holes in the front part of the model and then varnishing. This is then oiled and plaster poured into these countersunk places as well as over the outer faces of the teeth. The plaster being set, the wax is removed from the pin surfaces of the teeth and the teeth are backed or lined wth gold or silver plate, according to which of these metals is being used.

In backing the teeth *a pair of plate punches* will be needed. It is a good plan to mark with a lead pencil, a line just above the upper rivets on the tooth, all around, so that all the backings may be of uniform height. A strip of metal being taken the width of the tooth, a hole is punched into it. One of the rivets in the tooth is put into this hole and a twisting motion given to the tooth, pressing it, while doing this against the strip of metal. This leaves a mark where the other hole is to be punched. This being done, the metal is laid on the tooth and with a sharp point it is scratched to indicate any overhanging parts of the strips of metal. The holes are then countersunk to allow the pins or rivets of the tooth to fill in, and hold firmly to the back-

ing. The backing may be made to go up even with the cutting edges of the teeth or they may be fitted rounding. We prefer the latter form, as we think more translucency is given to the tooth by not covering the entire back with gold. It is well to chamfer the edges of the backing to avoid bulk, as also to give it a concave form so it may lie close to the tooth at all points. To accomplish this the backing may be struck on a piece of lead, with a large ball, *plate burnisher*, or it may be bent at its entire circumference with pliers into this form. At one time it was our habit to lay the tooth with the backing in position on a block of lead, on which a small piece of wax was put to make a kind of bed for the tooth, and use the rivetting hammer to rivet the pins to the backing ; but of late years we have found that this could be as effectually done with the plate punch protecting the face of the tooth with several layers of soft paper or cloth.

After the backings have been rivetted to the teeth they are filed and fitted so they will lie close to the plate, to which they are afterwards to be soldered. Many operators prefer, instead of making a plaster matrix, to invest the teeth at once, and take the teeth from the investment one by one and then back them. But we have found by this plan (especially with the molars and bicuspids) that a large part of the investment has to be cut away, in order that the tooth may be released, and by so doing these teeth are not held as firmly in their position as by the plan we have advised. When all the teeth are backed they are gummed to their places with adhesive wax. The matrix is removed and the case invested as has already been described to prevent the cracking of the plaster investment when soldering at page 94, Fig. 22, of the last paper. When the investment has hardened *all the adhesive wax* that was used to gum the teeth to the plate, must be scraped off *perfectly clean*. The backings and plate, where it is intended the solder is to flow, must be scraped *absolutely clean* and bright, when the case is ready for soldering. This operation has already been described. Before soldering the case *powdered borax* mixed with water on the solder box (an illustration and description of which has been given in a former article), to a creamy consistency is painted with a small camel's hair pencil, all over the backings and over that part of the plate where the solder is to unite the teeth to it. It is then placed in the soldering furnace (Fig. 19 of the last paper), or on the spider of the bunsen burner, Fig. 21 of the last paper, where it is allowed to heat up thoroughly before removing it to the carbon block (Fig. 20 of the last paper) for soldering.

The case being soldered is allowed to cool down gradually. When cold the investing plaster is removed and the case boiled in *a solution of sulphuric acid and water*, in the proportion of $\frac{1}{4}$ acid to $\frac{3}{4}$ water.

For this boiling an *acid pan* is used, or a porcelain evaporating dish. We prefer the latter. In purchasing *an evaporating dish* it is preferable to get one about the size necessary to boil off a full upper set, as also to select one where the *inside* of the dish is *glazed or enameled* and the outside not enameled. Dishes made in this way rarely crack on being heated, while if they are enameled *all over* they crack very readily. An excellent, and almost everlasting acid pan may be made as follows :

Cut a disk of card-board to a round form with an extension on one side of its circumference as shown in Fig. 26. This disk should be about $4\frac{1}{2}$ inches in diameter, exclusive of the extension, which should be an inch long. Lay the pattern of card-board on a piece of sheet lead $\frac{1}{8}$ of an inch thickness, and cut it out to the shape of the pattern. This being done the sheet lead is gradually chamfered with a coarse rubber file from its center to its circumference, as shown by the sectional delineation A, of Fig. 26. The disk may now be held on a " Croquet Ball " and with a horn hammer, striking it always at the thickest points, the soft metal may be stretched to a uniform thickness, into a hemisphere. The extension is intended for a handle. This may be punched with two holes and a longer, stiffer handle of wood or metal rivetted to it. Such an acid pan will never crack and will last a life-time, as acid has but little effect on lead. The borax, used as a flux while soldering, is dissolved off by the action of the acid. It has been recommended after boiling the case in acid to boil in *solution of soda*, but this is not essential.

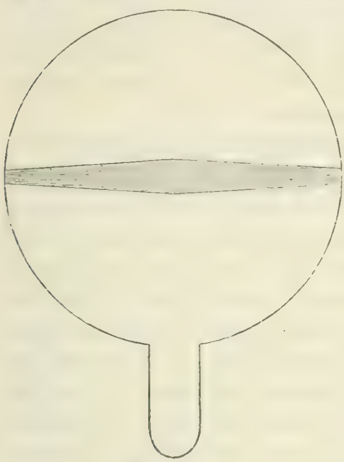


Fig. 26.

The case being soldered the next step is to finish it up. The safest way to do this is to invest in plaster and when this is hard to remove all superfluous solder with *scrapers*, *gravers*, *solder burs* and small fine cut engine *corundum wheels and points* revolved in the polishing lathe A perfectly uniform surface being thus secured, all the scratches left by those tools must be made smooth by means of pieces of *Scotch stones* small *leather wheels* charged with *Tripoly* or *fine pumice stone* moistened with oil, or with small soft *brush wheels* revolved on the polishing lathe. The case is now scrubbed thoroughly with a brush, hot water and soap, and the plaster investment may be

removed. The final polish is given with fine *rouge* or whiting, preferably moistened with alcohol rather than with water, by means of soft brush wheels or cotton buff wheels. The case is again scrubbed with a soft brush, hot water and soap and is then ready for the mouth of the patient.

GRINDING THE TEETH.

Little can be said to indicate how this is done. To one with a mechanical turn, the fitting of a tooth in its proper place and position will be appreciated by the workman almost without instruction. There have been devices offered to hold teeth while grinding them, but to the workman they are of little use. The tooth, be it ever so small, can be held in the fingers against the corundum stone, in the grinding and polishing lathe, and the point needing grinding removed.

When the bite has been taken, and the plate (or plates) secured in the articulator, the plate is warmed and a rim of wax attached to it. The opposing model is brought again t this rim of wax and all that is displaced by it, is dressed away with the warmed wax spatula. The teeth are now placed in position. In a full upper case with single gum teeth, the central incisors are generally taken first. These are pressed into the wax lightly in their proper position, one at a time, and fitted to the plate, by grinding it away little by little from the point that touches, until it is made to fit against the plate at all points. The gum surfaces of the teeth are next ground away. The next central is now fitted to the plate in the same way and then the gum surface is ground or jointed to its fellow. The lateral incisors are next fitted in the same way on either side of the centrals in the same way as described for the centrals, and so on to the end. As each tooth is ground and fitted it is our custom to wipe the wax dry in the place it is to occupy; the tooth is then warmed in the blaze of the spirit lamp and a small quantity of adhesive wax is melted on it. While it is still warm it is put in its place where it adheres firmly to the wax rim, used to hold the teeth temporarily in place while grinding. Each tooth is stuck on the wax rim thus, after it has been ground and fitted. If this be not done the teeth will fall away from the wax rim, which gets wet from the frequent trying of the tooth, which gives considerable trouble.

It sometimes happens that there is a knob or knuckle on the plate, which requires very careful grinding to fit the tooth over it. It is very evident, that if *a large wheel* is used to grind a tooth over such a point, no fit can be made. To overcome this difficulty we make use of such small wheels as are used in the handpiece of the dental engine for operations on the teeth, securing them to a chuck, as shown at

Fig. 27 and cutting a depression in the tooth, to fit over the knob or knuckle on the plate.

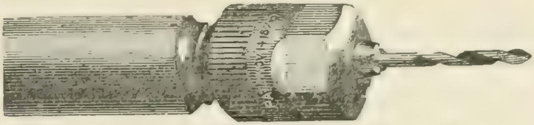


Fig. 27.

The tooth being fitted, approximated and articulated, a plaster matrix is made (as has already been described) to hold them in position while they are being backed or lined.

(To be continued.)

INDICATIONS FOR THE USE OF FILLING MATERIALS.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA.

1. In *soft* highly organized *teeth* no better material can be used on the *proximate surfaces* than *Gutta Percha.*

2. *Gutta Percha* is not indicated on the *masticating surfaces* of the teeth; or indeed in any position where it would be subject to the *friction of mastication.*

3. *Gutta Percha* may be placed on the *masticating surfaces* of molars or bicuspids, in *large cavities*, when protected from wear by a *gold cap*, placed over this and secured into the filling material by means of a headed pin or staple soldered to the under surface or cap.

4. *Gutta Percha* may be used on the *mesio-masticating* or *disto-masticating* surfaces of molars and bicuspids when the occlusion is such that the material would *not be subject to* wear.

5. *Gutta Percha* is indicated in cavities on the *buccal surfaces of molars* superior and inferior, as also on the *labio cervical cavities of oral teeth.* In these cavities it does well. See Paragraphs Nos. 15 and 21.

6. *Amalgam* may be used in all the crown *cavities* of *molars and bicuspids* and in the *mesio-masticating* and *disto-masticating* surfaces of the same teeth, *when the walls of such cavities are strong:* and when the economy of expense is the object. It is futile to expect success by placing *amalgam in contact with enamel* which is not supported or protected by a covering of dentine. Such frail teeth may be filled with *phosphate of zinc*, and a part of this cut away and then filled with *amalgam of gold.*

7. *Amalgam may* be used on the *distal surfaces* of *upper cuspids*; but it is unsightly (even though it may not discolor) in any of the

incisor teeth. It is generally indicated on the *distal surface of back teeth.*

8. It is useless to expect success with *amalgam* if it is placed in a cavity *next the enamel,* where this tissue is not supported by a covering of *dentine.* If this is done the enamel will chip or break away (as it is very brittle) leaving the hard amalgam standing. Such cavities are best filled as indicated in paragraphs Nos. 6, 13, 14.

9. *Amalgam* may be used at the *cervical borders* of *extensive proximate cavities in molars and bicuspids* (which go below the gum margin) with the aid of a matrix; which may be dressed into shape and smoothness and the *contour restored with gold* when such cavities are exposed to view. Where expense is the matter of consideration the contour may be built upon and restored in such cavities with the *Phosphate of Zinc.*

10. *Phosphate of Zinc* a most useful material, can only be regarded as a *temporary filling material*, or an *adjunct* to other filling materials. It serves more permanently in the acid than in alkaline diathesis but in e ther is *not a reliable* material for filling teeth.

11. *Phosphate of Zinc* may be used with fair success on the *masticating surfaces* of *molars and bicuspids.*

12. *Phosphate of Zinc* may be used as a *temporary* filling material in cases where *the nerve is nearly exposed*, to bridge over a season when irritation is due to thermal shock. In such cases much benefit is said to be derived by coating the cavity once or twice with Canada balsam dissolved in chloroform: letting each coat dry, by evaporating the solvent, before applying another. See par. 26.

13. *Phosphate of Zinc* is indicated *in large or deep cavities* as *a foundation* for *gold* or *amalgam.* See par. 26.

14. *Phosphate of Zinc* is excellent to fill *large or badly decayed cavities* in *molars or bicuspids*, when all or nearly all of the dentine has been corroded away. It seems, by its adhesion, to be able *to support the friable enamel.* It may be used alone in such cases when the *cervical border of the* cavity is protected by *a thin coating of Gutta Percha* or as *a foundation* for *gold or amalgam.*

15. *Phosphate of Zinc* although approximating in color to the teeth seems to serve *a poor end to restore the contour of the incisors.* For such purposes it seems to wash away, chip or become depressed at its junction with the enamel. For cavities in the *bicuspids and molars* however, when economy is the object, it does *fairly well*, if the floor of the cavity be covered with *gutta percha*, and this material chamfered off *to a thin edge* with warmed instruments *at the cervical margin*, and upon this, the superstructure of *Phosphate of Zinc* built.

16. *Tin* is a most excellent material for filling teeth. It is rather

soft to be used on the *masticating surfaces* of the teeth, yet even here it serves a good and preservative purpose, especially *in soft or poorly organized teeth.*

17. *Tin* may be successfully used on the *proximate surfaces* of all posterior teeth. Like amalgam, however, it discolors, and therefore may not be used in places exposed to view.

18. *Tin in combination with gold* is a most reliable filling material used at the *cervical margins* of *proximate cavities.* By the aid of the matrices now so generally used, these vulnerable places may be well and easily filled with tin, and a durable and beautiful superstructure of *cohesive gold* built upon it, either in the *mesio-masticating* or *disto-masticating* surfaces of molars and bicuspids.

19. *Gold*, strictly *non-cohesive gold*, has stood the test of time as a reliable filling material. The manipulation of this form of gold does not seem to be as well understood now as formerly; but of its reliability few there are who question it. Cases are common where fillings of this style of gold have lasted and preserved the teeth for 30 or 40 years. Cases are common where this form of gold held in the cavity by so poor a tenure that it could be readily pushed out with the lightest instrument, or pierced with a needle; and yet such fillings preserved the teeth. Cases are common where this style of gold is left full of pits and indentations, where there was apparently no effort used to secure a smooth unbroken surface to the filling, where the cavity was not entirely filled, and yet the teeth preserved through a long course of time,

20. *Gold, non-cohesive gold*, may be successfully used at the *cervical margins* of extensive proximate cavities *with a matrix*, and a contoured filling of *cohesive gold* built upon it.

21. *Gold, non-cohesive gold*, may be successfully employed on the *masticating surfaces* of the back teeth, in small or ordinary size *proximate cavities* and in the *labio cervical cavities* of all the oral teeth and the bicuspids. *Gutta Percha* is easier of application in such cavities *in the molars* and serves, equally, as good and preservative an object.

22. *Cohesive gold.* The rapid advance of decay in teeth, in the present age, as also the character of the teeth themselves, seemed to have called other materials and means, to combat these indication; hence the employment of *cohesive gold* to restore the frequent broken down condition of such teeth; because with it the restoration of contour was made possible with this form, which often was not within the non-cohesive.

23. *Cohesive gold* does well in *very small cavities*, or little pits of decay—as also on the *masticating* surfaces of the teeth and in the *fissures or sulci* of these surfaces.

24. *Cohesive gold* is indicated in all cases of *contour*, either alone or in combination with *Tin*, *non-cohesive or amalgam*.

25. *Oxi-chloride of zinc* may be used the same as the *Phosphate of Zinc*, in all cases of *devitalized teeth*. It is perhaps, more indicated in such cases because of its easier manipulation.

26. *The Balsam of Fir* or Canada balsam dissolved in chloroform is said to be a reliable coating for cavities, as well as an excellent non-conductor of thermal shock, and may be used to line such when they are *deep* or when it is thought that there is only a thin septum of dentine covering the nerve. See par. 12.

27. Gutta percha is not indicated as a capping for an exposed nerve, nor in cases when the nerve is so nearly exposed as to leave but a thin septum of dentine over the nearly exposed point.

COCAINE AS A LOCAL ANÆSTHETIC.

Knowing that cocaine is not well absorbed by the skin, and therefore does not produce much of an anæsthetic effect, Dr. Wagner of Vienna, was led to make experiments for the purpose of ascertaining a method by which a better absorption and anæsthesia might be produced. Basing his theory upon the established principle that fluids move from the positive to the negative pole in a galvanic current, he saturated the positive electrode with a cocaine solution, applied it to the skin, and applied the negative pole a short distance from the positive. As the result seemed satisfactory, he made a number of similar experiments in the clinic of Billroth to determine the value of the method in surgical practice. He found that by keeping the positive electrode saturated with a sufficiently strong solution, and allowing the current to pass in the manner described for a short time, incisions could be made in the skin without producing any pain. His results and the description of the method were presented to the Society of Physicians of Vienna, at their meeting February 5, 1886.

In regard to this method, I may say that I have personally made a number of experiments with a view of ascertaining its merits, which I intend to publish soon in the form of a paper, but which would occupy too much time were I to report them here. I will merely say that in my hands the matter is a success, and in my opinion one of the most useful discoveries in dermatology which has been made during the year 1886. In my experience, in the operation for the removal of superfluous hairs by electrolysis, and in other minor operations of the skin, the patient need experience absolutely no pain whatever.—*Dental Register.*

THE PRACTICAL PLACE.

PIVOT TEETH.

John A. Briggs, L. D. S. writing in the "*British Journal of Dental Science*" makes the following point for the removal of nerves from teeth badly decayed which require to be crowned, although the nerve may not be dead. If the case about to be treated be, say, an upper central incisor, badly decayed, but not so much so as to have encroached upon the pulp, then it were better to take a fine saw or small dividing file, and notch the crown all round the cervical edge, pretty deeply, then, to take a pair of cutting forceps with round blades, place a napkin in the mouth, behind the tooth, and crush the blades together, being careful to be quite steady, thus, the crown is usually severed from the root, leaving a clean, flat surface, with the pulp exposed in the centre. *Cover this over with a very small piece of citrate of cocaine paste, and cap it with paper, leave it for five minutes and then introduce a barbed nerve extractor*, rotate it until the nerve be wrapped about it, and then withdraw ; you can thus remove the nerve without the slightest pain and without any bad effect constitutionally."

GEORGE WASHINGTON'S LAST TOOTH.

Here is an extract from the will of John Greenwood, a dentist, who owned part of the property now owned by Mr. Pulitzer—for it was all in bits—in 1818. He died in 1819 :

" Item.—I give to my eldest surviving son my gold watch and chain, with that valuable relic hanging to the chain, the only or last tooth that remained growing in the mouth of our late president, George Washington, which tooth he sent to me from Mount Vernon, Virginia state, as may be seen in his own handwriting now in my possession. The said tooth must be kept as a relic, and given to the next male heir of my children."—*New York Sun.*

ADVICE TO ADVANCED DENTAL STUDENTS.

A correspondent believes the following hints may be of service ; we publish them with pleasure, but do not hereby pledge ourselves to all their statements, indeed, we fancy there will be many dissentients from some of them.

On no account do any operation without naming your fee.

Prepare the mouth before doing any operation by scaling and cleaning.

Endeavor to be gentle, but firm.

Remove all decay you can before applying arsenic.

Always get a good separation before filling interstitial cavities.

The acme of dentistry is gold filling.

In treating dead teeth open and remove as much of the septic matter as possible the first visit.

V shaped wedges are the best for keeping teeth apart during operation.

Every operator should have a lady assistant.

Downright sharp chisels, sharp burs and hot air for sensitive dentine.

Enter everything you do into a chart book; it is invaluable for reference.

Never run bad work down, but take it out and put better in.

The rubber dam should always be applied, even to successfully dressing a tooth.

In putting on "Richmond Crowns," see that you get your pin as long as possible.

Should you advise a "Bar" or "Bridge" case, see that everything is favorable, or you'll get into trouble.

Take great care to impress upon patients the necessity of the free use of the tooth brush.

Remember that whatever you do, do it as well as you can.

You may believe "That foil makes a better filling than any other form of gold."

BRITISH JOURNAL OF DENTAL SCIENCE.

Origin of Cæsarean Section.—Julius Cæsar first attracted attention through the Roman papers by calling the attention of the medical faculty to the now justly celebrated Cæsarean operation. Taking advantage of the advertisement thus attained, he soon rose to prominence, and flourished considerably from 100 to 44 B. C, when a committee of representative citizens and property owners of Rome called upon him, and on behalf of the people, begged leave to assassinate him as a mark of esteem. He was stabbed twenty-three times between Pompey's Pillar and 11 o'clock, many of which were mortal. This account of the assassination is taken from a local paper and is graphic, succinct and lacks the sensational elements so common and so lamentable in our own time. Cæsar was the implacable foe of the aristocracy, and refused to wear a plug hat up to the day of his death. Sulla once said, before Cæsar had made much of a showing, that this same young man would be the ruin of the aristocracy, and twenty years afterward, when Cæsar sacked, assassinated and holocausted a whole theological seminary for saying "eyther" or "nyether," the old settlers recalled what Sulla had said.

Cæsar continued to eat pie with a knife, and in many other ways to endear himself to the masses until 68 B. C., when he ran for Quæstor. —*Bill Nye.*

The B. D. Mfg. Co., are said to manufacture Steel regulating Jack Screws which do not rust though exposed to the fluids of the mouth.

INJECTING ALVEOLAR ABSCESS.

Dr. E. C. Brownlee gives his method of treatment as follows: First fill the cavity of a pulpless tooth with a packing of common vulcanizable rubber; charge the hypodermic syringe with carbolic acid and alcohol; push the pipe through the rubber, and inject the abscess without any leakage around the pipe.—*Cosmos.*

BLUING SMALL STEEL PIECES EVENLY.

First blue the object without any special regard as to uniformity of color. Should it prove to be imperfect, take a piece of clean pith, or a piece of dead wood that will not crumble very easily, and whiten the surface with rouge without letting it be very dry. Pieces when thus prepared, if cleaned and blued with care, will assume a uniform tint.

GUTTA-PERCHA VARNISH.

There is leakage around a gutta-percha filling, and yet you can prevent the clouding of the tooth by varnishing the cavity before filling, and for that purpose I think the varnish suggested by my friend, Dr. Ives, is the best. It is made of virgin rubber, 30 grains, in half an ounce of chloroform; gum damar and sandarac, each 20 grains, in half an ounce of chloroform; dissolve and make an ounce. It makes a very strong, solid, and somewhat opaque varnish.—*Prof. J. Foster Flagg.*

BLEACHING OF PULPLESS OR DISCOLORED TEETH.

It may not be generally known that peroxide of hydrogen is the great bleaching liquid that barbers have been using for several years to produce blond and white heads. Some time ago this led us to try it in bleaching teeth, and we are ready to say it far exceeds our expectations and does more than anything we have ever tried. Along with this its disinfectant properties make it doubly valuable.—*F. Y. Clark.*

FLAVOR FOR TOOTH WASH.

"Salol." Stamford, Conn.—The "refreshing" flavor you desire in your tooth wash may be produced by the oil of peppermint, or spearmint, or preferably a mixture of the two. Some other oil may be added with good effect. We suggest a mixture of peppermint 30 parts, spearmint 15 parts, clove 5 parts. Taking the two first as a basis, many other pleasant combinations can be made.

Our Clothing, is no doubt generally too heavy. We would feel much more comfortable with less clothing if we subjected ourselves to more cold baths and severe rubbing, and if we inured ourselves more to the vicissitudes of the weather. Our skin needs invigorating and toughening, and the circulation toning, so that, instead of being enervated, delicate house plants, we can take the blasts of winter and call them good. For the twelve years we lived in Minnesota, we did not wear a flannel undershirt, and the only extra clothing for out door exposure was a shawl.

Now we would not have the reader go to a sudden extreme and "catch cold," and then blame us for his temerity. If you have overclothed yourself, throw off a little of your extra clothing gradually and with caution, at the same time toughen your skin with ablutions and the severe use of a crash towel, a very little water at first and a good deal of rubbing, and after vigorous exercise. Try less clothing in the house before trying less outdoors. Gradually you will bring about such vigor of the whole system that you cannot endure your former amount of clothing, and the glow of the surface will make a cold fresh breeze feel good.

Dentists are too delicate; and the more they indulge themselves in their delicacy, the more delicate they become. Take every means to strengthen muscles, nerves and spirit, even if you have to saw wood or do any other menial work. You can afford to pay well for wholesome vigor, and stalwart brawn.

POISONS AND THEIR ANTIDOTES.

The following brief summary of the most rational and simple antidotes to the commoner forms of poison in daily use by artists and artisans has been compiled for the *American Analyst* by Dr. Francis Wyatt, and it will be seen that he has suggested the most appropriate to be applied in any emergency, pending the arrival or in the total absence of a skilled medical practitioner.

POISONS.	ANTIDOTES.
1. Acid—Carbolic, sulphuric, nitric, muriatic, nitro-muriatic, creosote, iodine, phosphorus.	White of egg well beaten up with water. A teaspoonful of mustard flour in a cup of hot water. Very thick lime water, (in case of sulphuric, nitric, muriatic or nitro-muriatic acids.)
2. Chromic acid, chromates, all preparations or compounds of chromium, antimony, copper, mercury, or zinc.	Abundance of white of egg in water. A teaspoonful of mustard flour in water. Copious draughts of an infusion of salt herbs.
3. Ammonia, soda, potash, alkaline, silicates, and sulphates.	Strong vinegar and water. Large doses of oil. Large doses of milk.
4. Prussic acid and its salts, all cyanides and sulpho-cyanides, oil of bitter almonds, and nitro-benzine.	Continuous and heavy douches of ice cold water over the head and spinal column. Mustard plasters on the stomach and soles of the feet. Prevent sleep.
5. Ether petroleum, benzine, fruit essence, concentrated or absolute alcohol.	Plenty of mustard flour in large quantity of hot water. Cold water douches. Fresh air. Prevent sleep absolutely.
6. Compounds of baryta and lead.	A teaspoonful of mustard flour in warm water. Strong solutions of Epsom salts and Glauber's salts in cold water.
7. Compounds of arsenic.	A teaspoonful of mustard flour in warm water. A teaspoonful of dialyzed iron mixed with the same quantity of calcined magnesia every five minutes for one hour. Then plenty of oil, or milk, or some mucilaginous tea—say linseed.
8. Oxalic acid and its salts.	Very thick paste of lime and water by large spoonfuls at the time. After several of these, large draughts of lime water. Finally, 4 ounces castor oil.
9. Nitrate of silver.	Large doses of ordinary kitchen salt dissolved in water after which one teaspoonful of mustard flour in warm water.
10. Nitrous fumes of vapors, arising in vitriol or chemical works.	Frequent and small doses of strong acetic acid—the stronger the better.

THE STINGS OF INSECTS.

Whether caused by bees, wasps, gnats, ants, or other insects; a strong solution of *cocaine* applied on cotton held in place with a bandage. The pain ceases at once, and there is no tumefaction.

HOW OLD ARE YOU?

Girls of a marriageable age do not like to tell how old they are; but you can find out by following the subjoined instructions given by the *Chester* (Pa.) *Local News*. Let the young lady do the figuring.

Tell her to put down the number of the month in which she was born, then multiply it by 2, then to add 5, then to multiply it by 50, then to add her age, then to subtract 365, then to add 115, then tell her to tell you the amount she has left. The two figures to the right will denote her age, and the remainder the month of her birth. For example, the amount is 822; she is 22 years old, and was born in the eighth month (August.) Try it.—*Items of Interest.*

TO CLEANSE THE HANDS AFTER THE WORKSHOP.

Dr. M. Vogel, writing upon the subjects of cleansing the hands, says that he has noticed that coppersmiths, tinsmiths, etc., whose hands become covered with a dirt from working in oxides and acids that cannot be removed by ordinary means, first rub them with warm oil, and when this has thoroughly penetrated, rub them with powdered borax. Subsequent washing with soap and water makes the hands perfectly clean. He advises those who have to use carbolic acid to go through the process above described first, and claims that in this way, (1) disinfection is made more thorough; (2) the hands are made purer than it is possible to make them with soap alone; (3) the hands remain soft and free from troublesome, rough epidermic scales, and the odor of carbolic acid is destroyed; (4) the uncomfortable anæsthesia after washing with carbolic acid is avoided.

Nansook Muslin as an Absorbent is according to *Items of Interest* but to be used to be appreciated. It should be of fine quality, quite thin and soft. Tear it in pieces of about 4 by 6 inches. Place dozens of them within easy reach in a drawer. They are very nice to dry a cavity of a tooth, and answer many other purposes. With them there is no further need of spunk or bibulous paper. The more times they are washed or ironed (of course, without starching) the better they are, till quite worn out.

HUMAN COLOR.

In treating a negro in Leipsic for an ulcerous affection it was found necessary to replace portions of the skin with pieces taken from one or two white persons. These latter pieces gradually grew darker in color, and finally as black as the patient's own skin. This singular fact led to an experiment being made of transposing a portion of black skin on a white patient and it was found after a few weeks these began to grow pale. In less than fourteen weeks they had, in fact, grown so white as not to be distinguishable from the patient's natural skin.

MOSQUITO BITES.

According to Dr. Gerard (*Archives*), the inconveniences resulting from bites by mosquitoes and gnats, especially when recent, may be relieved by rubbing the bitten spot with chloroform. The swelling quickly decreases, and the pain and itching disappear.

TO KILL TOOTH PULPS.

Dr. W. A. Johnson, of Peoria, Ill., says if arsenic one part, cocaine four parts, lanoline five parts, be applied to the pulp while aching, it can be removed without pain.

OZONE is an active state of oxygen, and is distinct from ordinary oxygen, which is the element in its passive state.

DRILLING PORCELAIN TEETH.

A cavity may be prepared for filling in a porcelain tooth by the following simple process: Grind out a smooth surface with a small corundum-wheel, to a depth corresponding to the coaptation of spherical surface of the wheel. Invest the tooth in plaster so as to hold it firmly, and then sharpen a small engine bur to a point one thirty-second of an inch across. Light blows with this, turning it at the same time after the manner of the sculptor, previously wetting the cavity with a mixture of the spirits of turpentine and camphor, and keeping it so, will enable you to drill a hole in each end of the oval cavity and connect them for filling with the greatest ease.—*F. B. Buck*, Jacksonville, Fla., in *Cosmos*.

MEDICINAL QUALITIES OF ONIONS.

The free use of onions for the table has always been considered by most people a healthy and desirable vegetable, and but for their odor which is objectionable to many, they would be found more generally on our dining tables.

For a cold on the chest there is no better specific, for most persons, than well boiled or roasted onions. They may not agree with every one, but to persons with good digestion they will not only be found to be a most excellent remedy for a cough, and the clogging of the bronchial tubes which is usually the cause of the cough, but if eaten freely at the outset of a cold, they will usually break up what promised, from the severity of the attack, to have been a serious one.

A writer in one of our medical journals recently recommended the giving of young raw onions to children three or four times a week, and when they get too large and strong to be eaten raw, then boil and roast them, but not abandon their free use.

Another writer, advocating their use, says: During unhealthy seasons when diphtheria and like contagious diseases prevail, onions ought to be eaten in the spring of the year at least once a week. Onions are invigorating and prophylactic beyond description. Further, I challenge the medical fraternity or any mother to point out a place where children have died from diphtheria or scarlatina anginosa, etc., where onions were freely used.

Scientific American.

THE CARE OF THE EYES.

At the sanitary convention held at Ann Arbor, Mich., not long ago Dr. C. J. Lundy, of Detroit, read a paper on "Hygiene in Relation to the Eye," which should have the widest circulation, especially among teachers and school officers. A fruitful source of eye troubles is shown to be the excessive strain upon the muscles and nerves of the eyes, due to faulty educational methods, the ill-planned and insufficient lighting of school rooms, poor ink and fine print in school books, and other causes which education might correct.

In conclusion, Dr. Lundy lays down the following rules for the better care of the eyes:

1. Avoid reading and study by poor light.
2. Light should come from the side, and not from the back or from the front.
3. Do not read or study while suffering great bodily fatigue or during recovery from illness.
4. Do not read while lying down.
5. Do not use the eyes too long at a time for near work, but give them occasional periods of rest.
6. Reading and study should be done systematically.
7. During study avoid the stooping position, or whatever tends to produce congestion of the head and face.
8. Select well printed books.

9. Correct errors of refraction with proper glasses.

10. Avoid bad hygienic conditions and the use of alcohol and tobacco.

11. Take sufficient exercise in the open air.

12. Let the physical keep pace with the mental culture, for asthenopia is most usually observed in those who are lacking in physical development. *Scientific American.*

THE MOST CONVENIENT MATRIX is one made of copper. Even where the cavity extends under the gums, take a piece of soft copper which you can make very soft by annealing, cut and adapt to your tooth, then remove and solder, either with soft solder or silver solder, then put on your dam and dry your tooth; mix phosphate or use chloroform and gutta-percha on the edge of your band or matrix toward the gums, if you have not the band as tight as you wish, use a wedge between the band and tooth. Dip the wedge in the gutta-percha solution to make it stick. When you have everything dry, you can burnish out your band so as to contour as much as you like. I use copper as patterns for all crowns as it is soft and easily adapted to the root or tooth, then I cut the gold by my pattern and solder it

Chicago. J. S. MARSH.

CURE FOR COLDS.

Many persons take cold by having cold feet, and to these the cold douche to the feet is a most effective cure. It stimulates the nerves and arteries of the feet and produces a brisk reaction of the warmth. A single application will sometimes set cold feet glowing that have not been warm for a whole winter. Often it will cure the life-long affliction of cold feet. The colder the water the better, and if one has not the convenience of a douche it will serve very well to stand in a tub or basin, filled to six inches deep with the coldest water at command. The warm reaction is essential.

FOR FEVER.

A valued subscriber in St. Louis sends us the following prescription for typhoid, scarlet and other fevers.

Oil pennyroyal ....50 drops.
Oil peppermint ....20 drops.
Good brandy.. 1 gill.
Distilled water.. 2 gills.

Take one-half teaspoonful in a little water every hour.—*Dental Luminary.*

A QUICK FILTER.

Take a clear piece of chamois skin, free from thin places; cut it of the desired length; wash it in a weak solution of sal soda or any alkali, to remove the grease, and rinse thoroughly in cold water befor using. Tinctures, elixirs, syrups, and even mucilages are, says a writer in *Drug. Circ.*, filtered rapidly. A pint of the thickest syrup will run through in four or five minutes. By washing thoroughly after each time of using, it will last a long time.

A CURE FOR DRUNKENNESS.

A half ounce of ground quassia steeped in a pint of vinegar, is recommended highly as a cure for drunkenness. A teaspoonful in a little water should be taken every time the liquor thirst is felt. It satisfies the craving and produces a feeling of stimulation and strength.—*Health and Home.*

A PHYSICIAN recommends the placing in the mouth of a fragment of myrrh if one finds himself in an infected atmosphere; he has employed this means with happy results in several epidemics. He considers myrrh as a specific against infection. Physicians in the East use this means constantly in visiting patients.

LABORRAQUE's solution of hypochloride of soda, is a valuable disinfectant. A few drops drank in a glass of water, or the same snuffed up the nostrils in catarrh, is excellent for offensive breath. When there is offensive odor from the arm-pits or the soles of the feet, a few drops rubbed on is an almost immediate relief. It is also a good tooth bleacher.—*Exchange.*

INTELLECTUAL IMPROVEMENT.

"The habit of regular reading, if only for fifteen minutes each day, should be steadily cultivated throughout life. Besides the leading journals of his trade, which no carriage mechanic can afford to disregard in these days, at least one good daily paper should be read; and some standard work on science, history, or biography should be kept on hand for convenient opportunities; while an occasional light novel, when the mind is too weary for more solid food, will certainly do no harm. We also recommend the SCIENTIFIC AMERICAN as an instructive weekly record of progress in all the arts and sciences, which will be found stimulating to the active mind and broadening in its influence. The constant study of that journal is a technical education in itself"

We heartily indorse the foregoing, especially the two concluding sentences, for which we are indebted to that able and most excellent periodical.—*The Hub.*

LITTLE RUBBER AND IMPRESSION CUPS.

Dr. G. A. Bowman, says: Cut a common hollow rubber ball, of any size desired, in two, and you get two cups—twins—which have no equal in which to mix small quantities of pastes, plaster and polishing materials of all kinds for use at the chair or work-table. They cannot be upset, are easily cleaned and always ready. From a No. 16 lower impression cup with acute angles, cut off about an inch from the posterior ends. The anterior part can be used for taking impressions of the anterior teeth, superior or inferior. The posterior ends are to be perforated in the centre of bottom. From sheet brass or copper cut handles of suitable length and width, perforate one end, and with a small copper rivet and washer unite them to the cup, rivetting on the under side. This cup will revolve on the rivet, enabling you to take any impression of two or more teeth situated anywhere in the arches above or below, at any angle—invaluable in crown and bridge work—perforate the sides of the cup to retain the impression material. All can be nickel plated, and when finished has cost but a trifle in time and money, but will save both in using.

A small, pointed insufflator furnishes the best means of blowing powdered medicines into root canals or into the "pockets" around necks of teeth, left by the removal of tartar.—*Archives of Dentistry.*

A rapid and easy method of cutting off teeth preparatory to mounting crowns, is to open into the pulp canal, then with a sharp oval bur, revolved by the engine, cut from within outward on the line with the gum margin, rotating the hand piece, so as to cut as equally as possible in every direction from the pulp canal. Most of the after work on the end of the root can be done more rapidly with this bur than with stones.—*W. T. Martin, D. D. S.*

CREOLIN.

The advantage of Creolin is that it is quite inoffensive both to man and animals. Its germicidal powers are ten times superior to those of carbolic acid, and its action on the spores is even more pronounced than that of the sublimate. Soluble in water, alcohol, and glycerine, it appears to have a peculiar calming and curative effect on open wounds. It does not effect the skin nor corrode instruments. Its odor is not disagreeable.

IODOFORM IN FILLING PULPLESS TEETH.

T. H. Lipscomb, D. D. S., Waco, Texas.

Iodoform in filling roots of dead teeth gives in the hands of the writer uniform success. This method is: The tooth having been thoroughly treated until all tenderness and soreness have disappeared, the rubber dam is then carefully adjusted, so as to prevent the iodoform from getting in the patient's mouth. A paste is then made with iodoform and carbolic acid, which is carefully introduced and forced down into the root canals, care being taken that these canals are filled solidly and free from air bubbles. The excess of moisture is then taken up by absorbent cotton or spunk, and all the unnecessary iodoform removed, after which a filling of cement is placed—sealing the cavity so as to be impervious to moisture. This remains for a few days, and if no soreness follows it is then ready for the permanent filling of gold or amalgam. The iodoform when used in this way and care taken to prevent any of it getting into the mouth, is not at all objectionable to the patient, as some would think.

By Dr. Geo. S. Staples, Sherman, Texas.

Amalgam crowns for back teeth, the writer thinks, are far superior to, as well as much cheaper than any form of crown. His method of constructing these substitutes, is, fully cleanse the root of all decay, leaving all points, if any, of sound enamel and dentine intact. Then twist a piece of binding wire around the root to get size. Then with a piece of copper plate, about thirty guage, make a band that by soft soldering will approximately fit the root, and allow the mouth to close naturally. In nearly all cases there will be sufficient retaining points to hold the crown, but if not, insert Bonwell's pins in roots fastened with amalgam; then with band in place fill it with amalgam. Cause the patient to close the mouth, thus you can obtain an articulation that it is impossible to get with any other crown, besides perfect joints and no cements to wash out, nor overlapping edges to catch secretions. The band is allowed to remain long enough for the amalgam to thoroughly harden, when it is cut off and finished with sand-paper disk, etc., being careful to leave no overlapping edges.—*Archives of Dentistry.*

THURLINGTON.

Dr. E. Parsons, says:—"This is one of the best therapeutic agents effective in sore mouth, pericementitis, sometimes following the filling eeth, at the above named remedy.—HOW TO USE IT.—Fold a piece

of bibulous paper several times, saturate it with the remedy, full strength, and lay it on the gum as nearly over the apex of the root as possible, keep it there twenty or thirty minutes. If the gums are spongy and bleed easily, apply it with a brush or mop, and wait a few minutes before rinsing the mouth. If there is general inflammation, dilute one part turlington with three parts of water—of this take one teaspoonful and wash the mouth. If the throat is sore, gargle with it. The wash is excellent for soreness caused by plate—it is equally good for burns and bruises.

SULPHATE OF COPPER IN THE TREATMENT OF PYORRHŒA ALVEOLARIS.

By J. W. Whipple, D. D. S., St. Louis, Mo.

The writer suggests the following plan of treating Pyorrhœa-alveolaris:—Bind a copper wire around the tooth or teeth affected and allow it to remain until a cure is brought about. The action of the sulphuric acid in the mouth will cause a slow but constant formation of sulphate of copper, which will settle in the pockets and thus produce a cure by its ceaseless action both day and night. The wire can also be so arranged as to close the mouth of the pocket, and thus prevent the accumulation of the foreign substances which always so much retard successful treatment. If necessary the patient can moisten the wire with a sufficiently weak dilution of sulphuric acid twice a day.

TO CONTROL DENTAL HEMORRHAGE.

Dr. Otto Arnold says: In all hemorrhage in which the bleeding vessels are to be reached through the circulation, gallic acid is the most efficient, as its chemical affinities do not afford the impediments to its absorption as those of tannin, etc. My favorite prescription is:—

Gallic acid,	one drachm.
Cinnamon water,	two drachms.

Sig.—Tablespoonful every hour until bleeding is arrested.

Two or three doses usually suffice to produce a clot, and all the trouble is then over.

In connection with the above, the tooth socket should be gently but securely packed with tannin. For this purpose I use a saturated solution of tannin in water, saturating a pledget of cotton in the solution, and packing it firmly into the socket.

Persulphate of iron, either in solution or salt, should positively be discarded from the list of styptics as unreliable, on account of the frail clot it produces and the tendency to secondary hemorrhage following its use.—*Ohio Journal of Dental Science.*

THIRST IN YOUNG INFANTS.

It is a mistake to suppose that because milk is a liquid food it is at the same time a drink which is capable of satisfying the thirst of infants. Although milk appeases hunger, it makes thirst more intense after it has remained some time in the stomach and digestion of it has begun. It is thirst which causes healthy, breast-nourished infants to cry for long periods of time in many instances. There are many cases of indigestion due to weakness or insufficiency of the child's gastric juice which would be greatly benefited or even cured if the child were allowed an occasional drink of water.—*Med. Classics.*

As soon as children have teeth, they should be taught to use them. It is all well enough to soften their food and keep them largely on liquid while toothless. But the very presence of teeth indicates that they should be used. If still the child is kept on soft food and liquids, and the teeth are not used, the whole system suffers, and the teeth decay. Vigorous use is essential to their solidity in the jaw, to their healthy growth and maturity of structure, to the proper development of the salivary glands, and to the digestion of the food. If the system is kept in health, and the teeth in vigorous exercise there is little danger of decay.

ANTIPYRIN A HÆMOSTATIC.

Among the many virtues claimed for this drug is that it possesses a marked effect in controlling hæmorrhage from the gums and sockets after tooth extraction.

CARBOLIC ACID AS AN OBTUNDANT.

The *Independent Practitioner* says we believe that Carbolic Acid is the best agent for obtunding sensitive dentine which is known to the dental pharmacopœia. A pulp may be painlessly removed by its use if patience be exercised. The extreme sensitiveness that sometimes exists at the ulterior point of a canal may be entirely removed if a little time and care are used in working the agent to the sensitive point. The rubber-dam must of course be first applied, and then a delicate broach, which is dipped in the carbolic acid, should be carefully worked into the cavity, and gradually advanced as the obtunding process goes on. If the cavity or canal be large enough, a film or two of cotton may be wound around the broach. The best instruments for this purpose that we have ever used are the Donaldson broaches and canal cleaners. If one of the latter can be employed, it will, simultaneously with carrying the carbolic acid to place, remove all the obtunded pulp.

EFFECT OF PEROXIDE OF HYDROGEN UPON THE TEETH.

Dr. W. H. Rollinson says:—"This preparation is in such extensive use in dentistry that a word of caution may be of value. I purchased a solution from a reliable apothecary in order to have a fair sample and into an ounce of it I put a tooth, which after a few hours (four) began to show marked signs of being acted on. The enamel had lost its lustre entirely. In two days the whole tooth became so elastic that it would bend in the fingers, and I could and have used this method of preparing teeth to be cut in a section machine.

A VERY NEAT AND EFFECTIVE BLOW PIPE can according to Dr. R. W. Chase, be made by attaching a piece of rubber tubing to the gasometer or cylinder of gas, using an ordinary mouth blow pipe attached thereto, the pressure of gas against the flame of an alcohol lamp makes a nice flame for soldering gold crowns, bands, etc. By this method dentists who do not have illuminating gas to use for such work, will find the above all that is desired.

CHEAP METHOD OF PULVERIZING METALS.

In this new process the metallic object is covered with a mixture of borate of lead, oxide of copper, and spirits of turpentine, and submitted to a temperature of from 250° to 330°. This deposit, upon.

IMPRESSION COMPOUND.

Dr. W. H. Rollins, writing in article in the "*Independent Practitioner*," on the subject of "Gas Furnaces and Enamel Fillings," gives the following directions for making "Impression Compounds:" Take of mastic 100 parts, paraffine 50 parts, black lead 30 parts. Melt and mix together and form into cylinders one-quarter of an inch in diameter and one inch long.

For use, prepare the cavity without undercuts, and smear it with a minute quantity of petroleum to prevent adhesion of the modelling compound. Soften only the extreme end of one of the sticks and press it firmly into the cavity. The cold part of the stick will act as a piston, producing a most perfect impression. Make several such impressions of each cavity. Then wrap a fine copper wire around each impression, dip them for a moment into ether and then into black lead, or precipitated silver, brush until there is an even coating and then deposit copper on the surface in the ordinary way, till the coating is thick enough; afterwards, when the impression compound is removed and the mould cleaned, it is ready for use.

The directions contained in the *latter paragraph* refers to the backing of "porcelain fillings" of which the article treats. ED

DENTAL AMALGAM, PREVENTING OF CONTRACTION, ETC.

By Dr. S. K. J.

In its abstracts from foreign journals, the "*British Journal of Dental Science*" gives an article on the above subject. Without going all over the article, which relates the various experiments of Sir John Jones, Mr. Kieby, Mr. Fletcher, Dr. Hitchcock and Dr. Bogue to ascertain the amount of contraction, expansion and edge strength in the various amalgams that were on the market, we give the conclusions arrived, at which is the gist of the article.

"One important fact made prominent by the experiments of Drs. Hitchcock and Bogue, viz.: Pure silver in combination with mercury sufficient to form a plastic amalgam is not, in that relation, a contracting metal when undergoing the process of crystallization, but, on the contrary, is expansive in its tendencies. Consequently, those evils which result from contraction in dental amalgams can be overcome by the use of a sufficient amount of silver to accomplish that purpose. Reviewing the above given facts, it is just to infer, viz.: To succeed in producing a non-contracting dental amalgam, less subject to discoloration than many are in use, that will not creep out or protrude from its position in a properly formed cavity, retaining in fair condition the corners and edges of fillings composed of such amalgam, it becomes necessary for the manufacturer to make use of the following combination or formula of constituent metals, the standard or unit thereof being fixed at one hundred, viz.: *eighty parts silver, fifteen parts tin, three parts platinum, and two parts zinc.* The employment of a large percentage of pure silver prevents contraction. The employment of a small percentage of platinum and zinc in a good degree renders much aid in preventing discoloration of fillings. The small percentage of zinc named will not in any case develop galvanic influences to an extent that will be objectionable. An alloy produced in conformity with this formula, or with but slight variation from it, will result in producing a quick-setting amalgam, a quality that will render some aid in preventing a globular conformation of the mass composing a filling.

THE CONSTRUCTION OF ARTIFICIAL DENTURES.

At the twentieth annual meeting of the Eighth District Dental Society, held in Buffalo, April 17 and 18, Dr. Geo. B. Snow made some valuable and practical remarks upon the proper method of proportioning artificial plates, those made of rubber, especially, that perfect and distinct enunciation may be secured. He said that if the cast of a jaw in which the natural teeth are in place be sawn longitud-

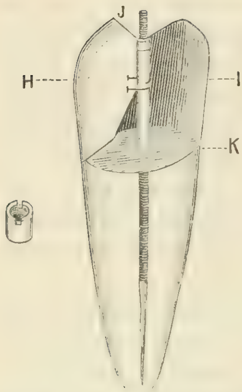
inally through the centre, and the contour of the palatine surface carefully studied, it will surprise most dentists. Nor will there be any great departure from the same general line, no matter what may be the shape of the mouth. A prominence will be seen just back of the anterior teeth, and it is just against this that the tongue rests in the production of many of the sounds of articulate speech. When the teeth are extracted this prominence is soon lost, and it is not entirely due to the absence of the teeth that the imperfect articulation of edentalous persons is due. This prominence does not exist. and hence the tongue does not perfectly rest against the anterior portion of the jaw, as is necessary in giving the sounds of d, t, g, j, and others of the letters of the alphabet.

When an artificial plate is constructed, it is usual to make it as thin as possible at this very point, where it should be thick, and hence the speech of those using gold plates, especially, is usually very indistinct. The annexed imperfect cut will illustrate this. The heavy line is about that of the usual jaw, with natural teeth, and at " A " is the prominence referred to. The dotted line is that of the ordinary artificial denture. The proper contour is obtained by adding to the thickness of the plate at the right point, until the natural contour is approached, and a prominence thus formed for the tongue to meet in articulate speech. If, then, the natural rugæ of the mouth can be reproduced, it will materially aid speech. But the plate should be especially thick where it is usually thin, and the added material should be so shaped as to reproduce the natural prominent ridge. Those who have experimented in cases in which there was a very disagreeable sibilant sound, or hissing, in conversation, will remember that if they overcame the difficulty it was not by making the plate thin at the anterior portion of the vault, but by adding to its thickness. The objectionable sound is caused by the escape of air through the imperfect occlusion of the tongue with the anterior portion of the roof of the mouth. If additional thickness be given the denture at this point it also adds to its strength just where rubber plates usually are weakest. Continuous gum plates usually give the clearest enuciation, because they are thick at the essential point, by the addition of the rugæ.

Dr. Snow is evidently a very observant and practical dentist as may have been noticed by the many valuable suggestions which have eminated from him in his published articles. The above commends itself especially to the mechanical Dentist in the construction of artificial dentures made on the Celluloid and Vulcanite bases.

A NEW PORCELAIN CROWN.

BY E. C. MOORE, D.D.S., DETROIT, MICH.



The accompanying illustration shows an easy but strong way of constructing a crown. A good strong screw is anchored in the root in the usual way and snipped off to suit the articulation of the occluding tooth; then a thin tubing of iridio-platinum is slipped down over this screw, and a piece of thin platinum (K) of sufficient size to slightly more than cover the end of the root, with small hole cut in the center, is slipped down over the tubing and burnished to nicely fit the root and over the edges. and caught to the tubing with a little plaster and sand; when hard, slip the two off together, in their relative positions, and solder. Place them back again on the root, the soldering process having softened the metal, complete the burnishing to a nicety and get an impression in plaster with tubing and plate in position. Before filling the impression place a piece of German silver wire in the tubing, of sufficient size to fit snugly, leaving the end projecting one-half to three-fourths of an inch—this to prevent the disturbing of the tube or crushing it in bending the pins in tooth H around it; from this impression you procure a model with the tubing in exact position. Now grind and fit the artificial tooth (H) to this, wax fast, invest, bend pins around the tubing, and solder. Having removed the German silver wire, the enlarged portion of the tube at the grinding surface to receive the circular nut (J) is made by using a larger piece of tubing and placed in the proper position after the first baking, and the body placed about it to hold while baking, and the second baking completes the crown as shown in cut—H, the artificial tooth, and I, the porcelain added. This when cemented to the screw and root, and the nut driven home while the cement is still in a yielding condition, makes a very strong and substantial crown.—*Archives of dentistry.*

The above is a good method of inserting a crown and the author is complimented for the succinct and clear manner in which he describes the operation. It may be done by those doing continuous gum work, or having the Land furnace for porcelain fillings but the *palatial* surface of the crown could be made of gold by any skilled mechanical dentist with slight modifications of the above suggestions.—*Ed.*

(Abstracts of British and Foreign Journals)

DENTAL ADVERTISER.

ROOT MEDICATION.

By S. Eschelman, M.D., D.D.S., L.D.S., Buffalo, N.Y.

The writer believes that, there is only one point of egress to the periodontal membrane for septic matter, is not true. 1st—if such were the case, the mere hermetical closing of the apical foramen would be sufficient to protect the vascular structures surrounding the root; 2d—clinical experience teaches us that such treatment soon receives a vigorous protest from the periodontal membrane. Microscopic anatomy of the tooth shows another way of access to the periodontal membrane. We find dentinal tubuli terminate three ways: 1st.—in loops; 2d—with the spaces of the granular layer; 3rd—with the canalicula of the cementum. Hence a direct continuation of living matter from the pulp to the periodontal membrane, through the dentinal fibres connecting with the cells which occupy the lacunæ and canaliculi of the cementum. Stowell believes that the dentine and cementum have a regular lymph canicular system; corresponding in a general way, with the lymph canicular system of the whole body. Neither the dentinal fibres in the dentinal tubula nor the cells in the lacunæ and canaliculi of the cementum, nor the protoplasmic masses in the interglobular spaces, quite fill the space alloted to them, but leave room for the flow of lymph about them. By admitting that lymph spaces exist in the dentine and cementum, we can easily understand how septic matter,—due to putrefaction,—can enter; also why such agents as arsenic will destroy the pulp, when applied to the tooth with a thick layer of intervening dentine. The therapeutic value of medicaments resides in meeting the three pathological conditions found in a putrescent pulp chamber; 1st—their power of destroying the products of putrefaction, 2d—their power of destroying the agents of putrefaction, fungi; 3d—their power of coagulating or incorporating themselves with the dead remains of the dentinal fibres. Regarding the products of putrefaction; sulphuretted hydrogen gas is the only one with which we will have to deal. The true deodorants are those containing chlorine, iodine, bromine, and oxygen, and some of the metallic salts; all of which decompose the sulphuretted hydrogen, forming solid or liquid compounds with it. Deodorants containing metals or bromine are not applicable as disinfectants of the pulp chamber. Only those containing chlorine, iodine and oxygen are useful, Iodoform and iodine are really the same. Nascent iodine decomposes sulphuretted hydrogen by uniting with the hydrogen form-

ing hydriodic acid, the sulphur being precipitated. Bichloride of mercury will decompose sulphuretted hydrogen, forming the black sulphide of mercury and hydrochloric acid. Peroxide of hydrogen is the best and most elegant disinfectant. It is a very unstable compound, readily yielding its extra atom of oxygen, which proves destructive to sulphuretted hydrogen gas by its union with the sulphur, forming dioxide, and the elimination of free hydrogen gas. Carbolic acid, creosote, eucalyptus oil and the essential oils have no effects as true deodorants, but accomplish the object, if an opening is left for the escape of sulphuretted hydrogen gas, by virtue of their therapeutic value as medicaments, thus remedying the second pathological condition mentioned, namely, the presence of the agents of putrefaction, fungi. All of the deodorants mentioned, with the exception of peroxide of hydrogen, are antiseptics which stand at the head of their class. After complete disinfection and sterilization of the pulp chamber remain medicaments which meet the third pathological condition, viz. coagulators which incorporate themselves with the dead albuminoid matter. Some have objected to the use of remedies that coagulate albumen, on the supposition that the pulp end of the tubuli becomes closed and does not allow the medicament to penetrate to the terminal ends of the tubuli. This is not so as can easily be demonstrated by coloring carbolic acid with carmine and keeping the pulp chamber of a tooth filled with the acid for a few days; when it can readily beseen that it has permeated the tubuli to their terminal ends. If we were to reject the medicaments which coagulate albumen we would be obliged to reject nearly all of our best antiseptics; as bichloride of mercury, nitrate of silver, carbolic acid, and chloride of zinc, all coagulate albumen. Iodine and iodoform will not coagulate albumen, but will incorporate themselves with it. Iodoform, while it is one of our best remedial agents in the conditions mentioned, possesses another valuable property in common with carbolic acid that the other medicaments mentioned do not possess: namely, anæsthetic properties, which give it precedence in the conditions mentioned when complicated with vascular disturbance of the periodontal membrane.

BOOK NOTICES.

A Handbook of Dental Pathology for Students and Practitioners, by Albert N. Blodgett, M. D., late professor of Pathology and Therapeutics in the Boston Dental College. Philadelphia, P. Blakiston, Son & Co., 1888. Price in cloth, $1.75.

This is a primer manual on the subject of Dental Pathology, and a work recommending itself to the student and practitioner. The subject of Dental Pathology has been considerably treated in text books as well as in the journals devoted to dentistry, but no volume devoted to this subject alone has as yet appeared—that we are aware of—the style is clear and the descriptions are well given, but while this is the case, there are some subjects of which the work treats, which are not carried out as carefully and as extensively as their importance demands. The size of the book is advantageous, and the typography and general get up in the usual elegant style of the publishers, yet it is unfortunate, that the excellent cut, Fig. 4, on page 36. showing the occlusion of the teeth, should have been inverted by the printer.

ED.

The Students' Manual and Hand book for the Dental Laboratory by L. P. Haskell, of the dental department of the North-Western University. Published by Welch Dental Company, Philadelphia, Pa., 1887.

The above work is a succinct manual for work done in the Dental Laboratory. It is a valuable reproduction, in book form (extended, illustrated and enlarged) of the many valuable papers which have appeared from time to time, in the dental journals from the pen of Dr. Haskell. The form, style, typography and general "get up" are attractive, and will form as valuable an addition to the dental Library as it will, a ready reference to the many points which sometimes, through forgetfulness, puzzle even the old practitioner. No one subject is dwelt upon at greater length than it demands, and being arranged in chapters, on each subject, the student may readily find the information he needs, without wading through unnecessary matter.

We commend the work, which is issued at the moderate price of *one dollar*, to all interested in prosthetic dentistry.

EDITORIAL.

We learn that Dr. J. N. Farrar, of New York, is engaged in writing an exhaustive work on the "treatment of irregularities of the teeth," which will be profusely illustrated. The work, we are told, will be in two volumes, of several hundred pages each, and containing over *one thousand* illustrations. The profession is largely indebted to Dr. Farrar for the many valuable suggestions, and appliances he has given it through his writings and illustrations in the dental journals for the past five or six years and we hail the coming of the work with pleasure embodying, as it no doubt will, all his suggestions under one head. ED.

IMPORTANT.

The success which attended our efforts in the *quarterly* publication of our journal, has been such as to warrant us in making it, for the future, a *bi-mensal* journal.

Although in this, the cost will be double what the quarterly edition was, it will continue to be furnished at the same price per year, viz.: *One Dollar*, to our subscribers.

It has been the aim of the publishers to furnish, in its reading pages, original thoughts and the freshest gleanings from domestic and foreign journals; and its editor appeals to the members of the profession to aid him in the work, with any contributions they may have, which will find ready space in its pages. The journal will be kept up to its past standard, and, we trust, improved and rendered more sought after by its more frequent issue.

With the hope that our efforts have met the good-will and favor of our patrons, and that a continuance of these will not only raise the tone of the publication, but make it a welcome friend to the practical dentist, we remain, respectfully,

JOHNSON & LUND,
per ED.

THE

Dental Office and Laboratory.

FOURTH SERIES.

VOL. 3. PHILADELPHIA, MARCH, 1889. No. 2.

THE DENTAL LABORATORY.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

Continued from page 7, No. 1, Vol. 3.

We have proceeded to describe the various manipulations of plate work, up to the soldering of the case. It remains now to tell how the plate is finished preparatory to its insertion in the mouth.

The work having been removed from the acid, where it was boiled, in order to dissolve off the borax, which was used as a flux for the solder, and which by the action of the heat has become as hard as glass; is then well washed with soap and water.

If the plate is thin, or only a narrow strip—as is sometimes the case for a partial denture supporting only a few teeth, attached by clasps,—and is likely to bend in the process of finishing; in such cases it is best to invest it in Plaster, while finishing.

The solder is then cut down with solder burs or small corrundum points in a chuck. [See Fig. 27, page 7, January number, 1889.], which is set in the polishing lathe.

If corrundum points are used, which are preferable, they should be kept wet while in use to cut down the solder, and the dripping will fall into the drip pan. A piece of paper should be laid over the entire bottom of the drip pan, and when the cutting down of the solder is completed, the water may be carefully poured off, and the gold saved which adheres to the paper. The paper may be dried, and the gold filings brushed off into any suitable receptacle; or the paper may be kept, and when a large quantity has accumulated, it may be burnt and placed in a crucible, in which the gold may be melted into a button or nugget.

The corrundum points used for cutting down the solder should be *of fine grit.* Those of coarse grit, while they may answer for very rough places, are apt to scratch the plate too deeply, and thus give extra trouble in making these places smooth for final polishing.

All the rough places being cut down to a uniform surface, these places are gone over again with small leather wheels, felt wheels, wheel brushes, etc., charged with tripoli, or fine pumice mixed *with water.* The wheel brushes should be small, as these reach places where large ones will not, and the bristles should be soft, as they carry the cutting powders better than wheels with stiff bristles.

The final polish is imparted with small brush wheels, with soft bristles, or with cotton buff wheels, charged with rouge. The wheels for this work should be kept away from dust and grit and used for no other purpose.

If used promiscuously—as for polishing rubber plates, as well as gold or silver work, the fine polish, so desirable to be imparted to gold or silver plates, will not be secured as gritty powders will find their way into the bristles, and leave ugly scratches on the plate.

The case, if it had been invested, is now freed, by cutting off the plaster, after which it is well scrubbed in hot water, with soap and a fine brush, after which it is ready for the mouth.

For polishing the inside of clasps a good plan is to tie to the side of the work bench a hank of gilling twine or thread about the size of the small finger. This is charged with fine pumice, or tripoli mixed with water. The end of the hank is taken with the left hand and the hank placed within the clasp. An up and down or sawing motion is given to the work which is held in the right hand, until the inside of the clasp is made smooth and polished by this manipulation.

A RIM FOR PLATES.

Fig. 28.

In continuous gum work, or in gold or silver plates with attachments for rubber or celluloid, it is advisable (especially for continuous gum work) to turn the plate on the outside to form this rim. This has generally been done, *by marking the plate line on the model*, building wax up to this line on the model and after varnishing same, making a die with this manipulation of the model. The plate can thus be swedged with the rim. This manipulation of the model entails some trouble and we are indebted to Dr. M. L.

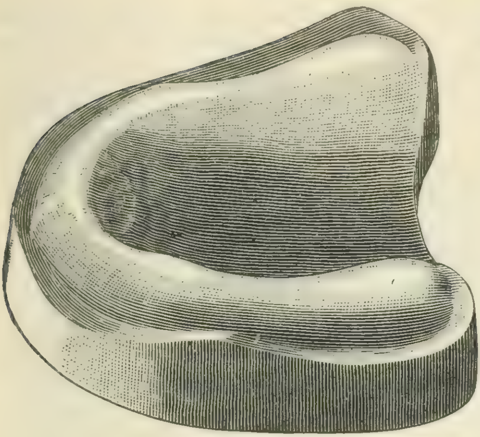


Fig. 29.

Long for the following suggestion which simplifies the operation. He removes the plaster impression from the impression cup, and marks the plate line *in the impression.* The impression is then cut down with a square edge as shown in Fig. 28. A model is made, in the impression, thus prepared, with much less trouble than by the plan of manipulating with wax. The model thus made is shown in Fig. 29.

Such a rim does well, should the plate line have been *well calculated;* but if not, and there be a necessity for subsequent cutting, to relieve pressure or chafing on the outside, the rim would be spoiled, at the point cut, and the beauty of the work marred.

REPAIRING GOLD OR SILVER WORK.

Any kind of artificial work which has been worn in the mouth for any length of time, gets coated with a mucous deposit, which is of a greasy nature, and which adheres to the denture quite firmly. It becomes necessary, before any attempt is made to repair a crack in the plate, a broken clasp, or a lost tooth, that the plate should be cleaned thoroughly of this greasy film. To do this effectually, the plate should be boiled in a strong solution of soda, or concentrated lye, or caustic potash, *in a porcelain evaporating dish.* This being done, it is then boiled in the usual solution of sulphuric acid and water that is employed to dissolve the borax used in soldering. With this preliminary, which is important, the case may be proceeded with for the repair of the damage. Wherever the plate is to be soldered it should be scraped *perfectly clean and bright*, and as a rule considerable borax used, at the place of repair, with the solder. Silver work, as a rule, requires more borax than gold work. If a clasp is to be attached to a tooth in repair work it may be necessary to take an impression of the tooth to be clasped. We have found, a very convenient way to take an impression for such cases is to take a piece of pure tin plate of No. 20 thickness of the gauge plate, about one inch wide by one and a half inches long. This is perforated with a number of holes, with a drill in the lathe, about one-eighth of an inch in diameter,

or preferably with a shoe punch. The softness of the metal permits it to be bent into any form. The holes punched through it are for the purpose of holding the Plaster of Paris, of which the impression is taken and preventing it from leaving the impression device. Such a device will also be found very serviceable in taking impressions for crowns or pivot teeth. Small impression cups as shown in Fig 30, have lately been designed by manufacturers, which serve well for this purpose. The plate being placed in position, impression plaster is mixed with water and an impression taken of the tooth to which the clasp is to be fitted, as well as of the plate to which it is to be attached. A model is made from this to which the clasp is bent and adjusted to the tooth and plate.

Fig. 30.

To attach a tooth to the plate it *may* be necessary, in repair work, to take the bite ; but this will only be necessary when there is an abnormal closure of the teeth, or where an opposing tooth impinges into the space where the tooth is to be attached.

For repairing a crack in the plate, the crack should be well scraped and cleaned. Reliance should not be placed *only on the solder that flows into and on either side of the crack;* but a thin piece of pure gold or platinum should be burnished to fit closely over the crack and the solder made to flow into the crack, and under and over this piece of plate to give strength to the fracture without unnecessary bulk.

REGULATING APPLIANCES.

The system of regulating the teeth by means of screws, bands, tubes, plates and springs require neat and small appliances for the accomplishment of the object in view. The strap band of Dr. Farrar will be found very efficient in quite a number of cases either singly or combined with a vulcanite plate to form a solid immovable buttress by which other teeth are moved, Fig. 31 represents the strap band used to draw a cuspid back into the space recently occupied by the 1st bicuspid which has been extracted. To make a strap band a piece of gold or silver wire is taken, in size large enough to pass through hole No. 1 of the bur gauge, and long enough to pass around the molar coming forward and passing around the cuspid. This wire is then annealed and held on the bench anvil, Fig. 32, when

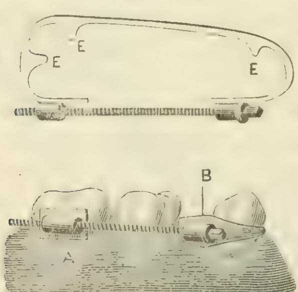


Fig. 31.

it is hammered flat. Some small pieces of gold or silver scraps are collected and laid on a piece of charcoal where they are fused into a globule and then thrown into the acid pickle. Removed from this, it is hammered flat until it is about one-thirty-second of an inch thick. Two of these globules are made: one for the *threaded* and the other for the *free* nut. To make the threaded nut a hole is drilled through the piece of metal. *The drill* used for this purpose should be smaller than *the tap.* For instance: if the tap just passes through hole No. 6 of the bur gauge, the drill should just pass through hole No. 4 of the same. The hole being drilled for the threaded nut, the tap is secured into a pair of pin vices and a thread cut through the hole with the tap. The tap should be used carefully, with plenty of oil. The metal is held in another pair of pin vices and the tap gradually insinuated through the hole, coaxing it, as it were, until the thread is fairly cut. For the free nut it will only be necessary to drill a hole through the metal large enough to let the screw part of the bolt pass through this hole snugly. The piece of metal into which the screw thread was cut is now filed down to its smallest dimensions, consistent with strength, and this soldered on to that end of the flattened wire that passes around the molar, on its buccal surface A, Fig. 31. To solder this we make use of small iron wire clamps as shown in Fig. 33.

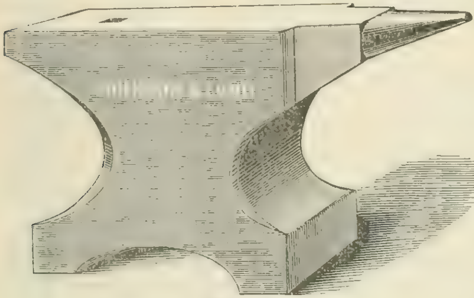


Fig. 32.

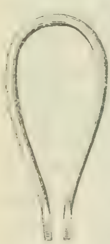


Fig. 33.

These little clamps are easily made of piano wire or iron wire and will be found very serviceable for many purposes. One end of the clamp is passed into the hole of the threaded nut while the other end is sprung over the end of the flattened wire that passes around the molar. This holds the two in position while the solder is applied and melted so as to unite the two. In the cut, (Fig. 31) these free and threaded nuts are shown as made of tubing; but to cut a thread in tubing, will be found much more difficult than in a piece of solid metal; and it is for this reason that we have described a manner of doing this in the easiest way. The free nut is soldered to the other end of the flattened wire in the same way as described for the threaded nut. The two nuts being soldered on, the next procedure is to make the bolt

which passes through the free nut and is caught into the threaded nut.

Fig. 34.

For this purpose a *screw plate* will be needed. Those made by P. S. Stubbs and known as "Stubbs notched screw plates" are the best, Fig. 34. To cut a thread on a piece of wire it is necessary that the wire should be *just the right size. If too small* an imperfect thread will be cut on it; *if too large* there is risk of breaking off the wire in the screw plate, out of which it is almost impossible to remove it. The best way we have found to determine the size of the wire, is to place a piece of brass wire in the chuck of the lathe and filing this down gradually—(trying it from time to time, and cutting a short screw on it) until the right size is ascertained.

Fig. 35.

When this has been ascertained, the wire is passed through the holes of the bur gauge and the size *noted* to cut a screw of a certain size. A note of this is made so as to save the trouble of the same procedure at another time. The wire of which the bolt is to be made, whether it be of gold or silver, is now placed in the chuck of the lathe and reduced by filing to the proper size by passing the hole of the bur gauge over it until it is of the right size. The threads are now cut on it, by holding it in the pin vice, Fig. 35, (or in the chuck removed from the lathe) and turning it round and round carefully in the proper hole of the screw plate. The bolt is made rather longer than is actually needed, any excess of length being easily cut off. After the threads are cut, a piece of plate is punched and a circle scratched on it with a pair of dividers, Fig. 36. It is then reamed out so as to fit over the screw and form a flange or shoulder at the head of the bolt.

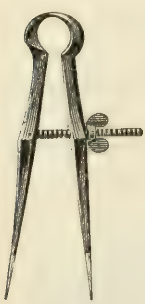


Fig. 36.

This is then passed over the threads, and is soldered to the wire of which the bolt is made. This being soldered, the edges are rounded, with a file down to the mark scratched on it with the dividers, and the wire is placed in the chuck, in the lathe, and this flange is nicely filed or turned round. Fig. 37 represents the piece of wire on which the thread has been cut, as also the small piece of plate B, which is to form the flange of the bolt head. This being turned round, as described, it is removed from the chuck and screwed into the screw plate down to this flange. Enough of the wire beyond the flange is

now sawed off, to form the square head of the bolt as shown at A, Fig. 37, and this is filed square, with a flat file, to fit the key to be used with it. Fig. 38 represents the bolt completed.

Fig. 37.

To make a key to be used by the patient will next be described. Watch keys, such as are shown at Fig. 39, may be bought at watch furnishing establishments at from 20 to 30 cents per dozen. One of these is taken and a part of the handle is filed off at the dotted lines, A. A piece of iron wire about three inches long and the size show at Fig. 39 is notched on one end as indicated at B. This is dipped in soldering fluid (the muriate of zinc) and while held in the blaze of a spirit lamp it is tinned with tinner's solder at the slotted end. The key is likewise tinned in the same way from the points A to C. This part of the key is now inserted into the slot made in the iron wire at B, the two parts are held together with binding wire and small pieces of tinner's solder are added to the two, and being held in the blaze of the spirit lamp until the solder melts the two are united as shown at Fig. 39, D.


Fig. 38.

Fig. 39.

To complete the strap band it will be necessary to solder two or three thin pieces of plate to the flattened wire, as shown at E, Fig. 31. These are intended to bend over the masticating surfaces of the teeth, to prevent the appliance from sinking into and wounding or irritating the gum. It is well to thicken or strengthen the strap band at the point that passes in front of the cuspid tooth, to which the free nut is soldered, as shown at B, Fig. 31, as also at A under the threaded nut, for as the flattened wire of which it is made is so delicate and thin, the appliance is apt to turn or twist when pressure is made with the key to tighten the band. A pair of strap bands, such as has been described, will be found very useful if attached to a vulcanite plate, for the purpose of forming a firm, steady, immovable fixture, by which other teeth may be moved. Fig. 40 represents such an appliance. The strap bands are attached to

the vulcanite plate by means of extensions soldered to them, as indicated by the dotted lines in Fig. 40. This useful contribution to regulating appliances is the suggestion of Dr. Farrar.

While we have described the manner of making bolts for these strap bands, as also the manner of making keys to be used with them by the patient, we must admit that the process is attended with considerable labor and tediousness, and we have adopted a plan lately by which much of this labor can be overcome Dr. How has instituted a system of screw posts and nuts for pivoting teeth, and some of the screws which he uses for pivoting teeth may be made very available for making the bolts for strap bands. By this system the making of bolts and threaded nuts (so troublesome and tedious) can be entirely dispensed with, and the work which would consume almost a day to accomplish may be done in two or *three hours at farthest.* By reference to Fig. 41 it will be seen that these screw posts are made in three sizes, either of which is quite large enough and strong enough to make traction on the tooth to be moved. It will be seen that the post B, Fig. 41, has a threaded nut on it. (The other sizes, A and C, may also be procured with threaded nuts to fit). This nut may be soldered to the strap band at A, (Fig. 31) while a free nut, which is easily and quickly made of tubing, or of a solid piece, as before described, can be soldered at B (Fig. 31) and the appliance completed in a short time. To make the square headed bolt, as shown at Fig. 38, the Headed screws (Fig. 42) may be used with the nut as shown at Fig. 41. A flange may be soldered below the head, as described and shown at Fig. 37, after which the head of the screw may be filed square to fit the key shown at Fig. 39. Should it be desirable to have a longer bolt than the "Headed screws" the little nut as shown at B, Fig. 41, may be carried to the end of a long post and soldered to it. A flange as shown at Fig. 37, may be also soldered to this post beneath the nut, and the nut filed square to be used with the key, Fig. 39.

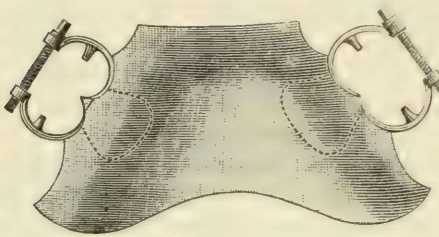
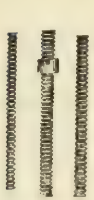


Fig. 40.



. . C
Fig. 41.

A B C
Fig. 42.

If Dr. How could devise these headed screws *with a solid head* they would be of great advantage to the dentists in making regulating appliances and doubtless for other purposes.

TO MAKE TUBING.

Take a piece of metal, gold, silver or brass, about No. 30 thickness of the plate gauge. Let this be about three or four inches long and about a quarter of an inch wide. Cut the edges perfectly straight and parallel to each other. Anneal it, and commence to bend it along its entire length with a pair of *plate benders*, (see Fig. 13, page 87, October number, 1888). After it is thus started, lay a large steel knitting needle in this gutter like piece of plate, and complete the bending of the plate into a rough tube, over the knitting needle, with flat nose pliers. This being done, take a piece of wire (gold, silver or brass, according to the tubing you are making) and secure it in the chuck of the lathe. File, or turn on one end of this wire a shoulder, so that the part filed will fit snugly in the rough tube you have made, as described above. This being done, the wire is removed from the chuck and the other end sharpened so it will pass through the holes of the wire plate. Fig 43 shows the piece of wire subjected to the above process. The part filed to a shoulder A is now soldered *into* the rough tube, and after filing off the excess of solder it is passed through the holes of the wire plate and thus reduced to the size desired. The object of this wire is merely to have something solid to hold to while passing the tube through the holes of the wire plate. Silver or gold tubing thus made will be found very serviceable for many appliances used for regulating the teeth.

Fig. 43.

To make a split plate it will only be necessary to mould a piece of wax over the palatine surface of the model. This is flasked, vulcanized and finished; after which two holes are made in the plate for the reception of the ends of the piano wire springs when this is again vulcanized. It may be done with one vulcanizing, but if so done, it will be impossible to polish the plate as the piano wire spring will be in the way, so that for the comfort of the wearer this little extra trouble may well be taken. To vulcanize the springs into the plate it will be necessary to coat the ends which enter the rubber with tin. If this is not done the rubber will not harden around the spring on account of the affinity which the sulphur, in the rubber has for the iron. To do this, the ends of the springs are dipped in soldering fluid (the muriate of zinc) after which they are dipped into melted tin or tinner's solder. To do this nicely a neat little pot or receptacle

can be made out of a brass thimble to which a suitable handle is *hard soldered* or rivetted as shown in Fig. 44. Pieces of tin or tinner's solder are placed in the pot, where they are readily melted over the blaze of the spirit lamp, and while melted, as much of the spring is covered with tin as is deemed necessary by dipping the ends in the melted tin.

Fig. 44.

To twist a tooth, nothing is so effective as a platinum band burnished to a tooth *in the mouth* (or on a tooth of the plaster model) with pieces of tubing soldered to this band at points most suitable for the rotation. For this purpose very thin platinum plate is passed around the tooth (in the mouth or on the model) and fitted nicely to it by burnishing. This is removed carefully and the lapping ends soldered with gold solder. The tube is now soldered to the band and the band secured to the tooth with phosphate of zinc. Fig. 45 illustrates the idea which has been suggested by Dr. E. H. Angle, of Minneapolis. The same principle may be applied to rotate a tooth as well as to press a tooth inward by the united efforts of a band of this kind to which rubber rings are attached and fastened to Farrar's strap band plate as shown at Fig. 40.

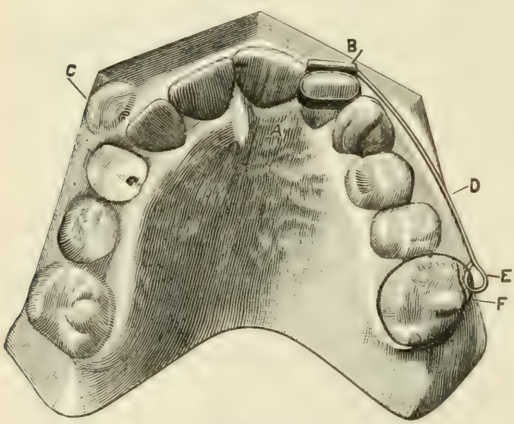


Fig. 45.

To make the Kingley's stay plate I have found the following plan most available as well as simple. The teeth being gotten straight, a

Fig. 46.

piece of thin platinum plate of the necessary length, (from cuspid to cuspid) and about one-eighth of an inch wide is closely fitted to the outer faces of the teeth by burnishing. Another piece of the same, a trifle narrower, is burnished to fit closely against the first and these two pieces are soldered together. A third piece, still narrower, may be burnished to the others and likewise soldered, and to these, a piece of gold or silver wire may be hammered flat and fitted to these pieces of platinum,and passing between the cuspid and bicuspid is bent to fit against the palatine surface of the model. This wire band is then soldered to the prepared platinum, Fig. 46, after which it is filed, finished and polished, and finally vulcanized into a plate of vulcanite covering the roof of the mouth. It need scarcely be mentioned, that should silver wire be used, instead of gold, the ends that pass inward to be vulcanized into the plate, must be well coated with tin or tinner's solder before vulcanizing as described in this paragraph where "Piano wire" springs are used. Fig. 47 illustrates the Kingsley's stay plate.

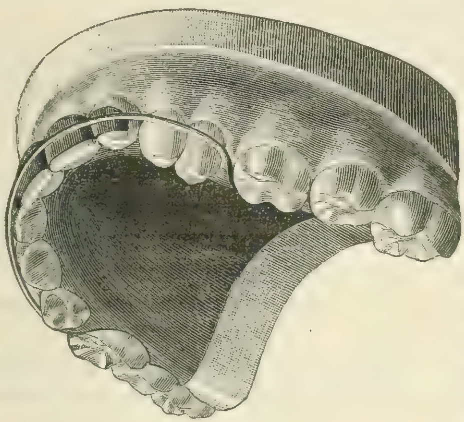


Fig. 47.

THE PRACTICAL PLACE.

DEATH FROM NITROUS OXIDE GAS.

Mrs. Elizabeth Cusick, a lady of sixty, living in this city, died recently after administration of nitrous oxide gas. She went to a dentist's office with her daughter, for the purpose of having four teeth removed, and insisted on taking the gas, notwithstanding that the dentist advised her that it would be dangerous, as she was very fleshy. A little brandy was given to her and then a quantity of gas much less than the usual amount, was administered and the operation performed. She recovered from the operation and went into an adjoining room to rinse out her mouth. In five minutes she returned complaining of oppression. Hypodermics were administered and

Dr. A Clark, who lives near by, was called in, but the woman died just forty-five minutes after the gas was administered. An autopsy showed that she had died of fatty degeneration of the heart.—*Druggist's Circular.*

HEALTH RULES.

From the Sanitarian.

Never lean with the back upon anything that is cold.

Never begin a journey until the breakfast has been eaten.

Never take warm drinks and then immediately go out into the cold.

Keep the back, especially between the shoulder blades, well covered ; also the chest well protected. In sleeping in a cold room establish a habit of breathing through the nose and never with the mouth open.

Never go to bed with cold or damp feet.

Never omit regular bathing, for unless the skin is in active condition the cold will close the pores and favor congestion and other diseases.

After exercise of any kind, never ride in an open carriage or near the window of a car for a moment ; it is dangerous to health, or even life.

When hoarse, speak as little as possible until the hoarseness is recovered from, else the voice may be permanently lost or difficulties of the throat be produced.

Merely warm the back by the fire and never continue keeping the back exposed to the heat after it has become comfortably warm. To do otherwise is debilitating.

When going from a warm atmosphere into a cooler one, keep the mouth closed, so that the air may be warmed in its passage through the nose ere it reaches the lungs.

Never stand still in cold weather, especially after having taken a slight degree of exercise, and always avoid standing on ice or snow, or where the person is exposed to cold wind.

From the Record.

The treasurer was a man who could raise himself above his surroundings. By profession he was a dentist. He used to fill a customer's tooth with some sort of an iron preparation and charge him two dollars for it, and then if the filling dropped out before the man got out of the office he would drag him back in the chair and charge him three dollars for putting it in the second time. He claimed that a man who didn't know enough to keep his tongue against the filling and hold it in didn't deserve any financial pity. He said a man

who had a tooth filled was effeminate anyhow. The proper way was to have the tooth pulled, and he claimed that if you had a clear conscience another would grow in. He said this was a well-established fact in dentistry. He claimed, too, to be the only man in town with a conscience in such condition that the cutting of a new tooth was a comparatively easy job. He posed as having cut four full sets of teeth, with conscience enough left for another lot and a new head of hair.—" Some one who knows."

A GROUNDHOG BAROMETER.

It is not generally known that the rendered fat of a woodchuck is as good a barometer as any we have to-day. While in the country, a short time ago, the writer had occasion to travel through the lower part of Berks. At the house of a friend he pressed me to take an umbrella with me. There were no signs of a storm. I asked him why he persisted in so dogged a manner for me to accept the article. " Why," said he, " look at my barometer." There upon the shelf stood a bottle sealed with beeswax. It was all cloudy. The old gentleman said that he had used this one for more than twenty years, and if a storm was brewing the barometer got cloudy twelve hours before the rain or snow began to fall. In clear weather the oil was always clear.—*Reading (Pa.) Herald.*

ADHESIVE QUALITIES OF ONIONS.

Paper pasted, gummed, or glued on to metal, especially if it has a bright surface, usually comes off on the slightest provocation, leaving the adhesive material on the back of the paper, with a surface bright and slippery as ice. The cheapest description of clock dials are printed on paper and then stuck on zinc, but for years the difficulty was to get the paper and metal to adhere. It is, however, said to be now overcome by dipping the metal into a strong and hot solution of washing soda, afterward scrubbing perfectly dry with a clean rag. Onion juice is then applied to the surface of the metal, and the label pasted and fixed in the ordinary way. It is said to be almost impossible te separate paper and metal thus joined. Probably metal show tablets might be successfully treated in the same manner.—*Scientific American.*

ARSENIOUS ACID AND IODOFORM.

A number of formulæ have appeared in the journals during this year, professing to destroy the pulp without pain; all of these have

been given in this journal and nearly all of them given a trial, but they have "not invariably succeeded in making devitalization a painless process."

Dr. James Truman gives in the *Cosmos* for November his experience with a mixture of iodoform and arsenious acid ; he thinks he has found a "painless devitalizer under all conditions." He writes : "The number of cases now treated, covering all conditions of pulpitis, justify the opinion that the pulp can be devitalized while in a highly inflamed condition without a particle of pain. * * *

The mode of using is very simple. The usual precautions are adopted of rubber-dam, drying the cavity, etc. Then I take the amount of arsenious acid I propose to employ, it being understood, of course, that there is no change from the usual practice in this respect; place the arsenic on a glass slide kept for the purpose, and add an equal quantity of iodoform, or an excess, it not being material; then a five per cent. solution of carbolic acid in sufficient quantity to make a paste; and the whole is carried to the pulp on a piece of cotton the size of a pin head. This should then be covered with a cap made from platinum, or, which is equally as good, red gutta-percha; then cover in the usual way."

A good way to cover the application is to fill the cavity rather loosely with cotton, and then add a drop of sandarac varnish. H.

DEATH BY ELECTRICITY.

Dr. Richardson writes on this subject in the *Asclepiad* as follows : "In some researches on the application of the electric discharge for the painless extinction of the lives of animals to be used as food, the details of which I recorded in the *Medical Times and Gazette* for the year 1869, this mode of death was anything but certain in its effects. Sheep stricken apparently into instant and irrevocable death by electricity, after a few minutes show signs of life, and if they had not been dispatched in the ordinary way by the knife would have been restored to consciousness. The same fact has been observed in attempts to kill dogs by the electric shock, and I once published an instance in which a large dog, struck into perfect unconsciousness by the stroke from a powerful battery, was submitted to a surgical operation while lying, to all appearances, dead, and was yet so little affected as to make an easy and sound recovery. It need not be inferred from such facts as these that the electric shock will not kill at one discharge—in most cases it will—but, exceptionally, instead of killing outright it will simply stun, and may induce the semblance of death instead

of the real event. It will be only common humanity, therefore, for the authorities of New York, when they begin to give the *coupe de grace* by the electric shock, to supplement the process by a *post mortem* examination of the victims, so that the act may not be crowned by burying the victims alive."

KEEPING TOOLS.

Keep your tools handy and in good condition, remarks the *Manufacturer and Builder.* This applies everywhere, and in every place, from the smallest shop to the greatest mechanical establishment in the world. Every tool should have its exact place, and should be always kept there when not in use.

Having a chest or any receptacle, with a lot of tools thrown into it promiscuously, is just as bad as putting the notes into an organ without regard to their proper place, If a man wants a wrench, chisel, or hammer, it's somewhere in the box or chest, or somewhere else, and the search begins. Sometimes it is found, perhaps sharp, perhaps dull, may be broken, and by the time it is found he has spent time enough to pay for several tools of the kind wanted.

That habit of throwing every tool down, anyhow, in any way, or any place, is one of the most detestable habits a man can possibly get into. It is only a matter of habit to correct this. Make an inflexible end of your life to have "A place for everything and everything in its place."

It may take a moment more to lay a tool up carefully after using, but the time is more than equalized when you want to use it again, and so it is time saved. Habits, either good or bad, go a long way in their influence on men's lives, and it is far better to establish and firmly maintain a good habit, even though that habit has no special bearing on the moral character; yet all habits have their influences.

Keeping tools in good order, and ready to use, is as necessary as keeping them in the proper place. To take up a dull saw or dull chisel, and try to do any kind of work with it, is worse than pulling a boat with a broom, and it all comes from just the same source as throwing down tools carelessly—habit. Nothing more or less. To say you have no time to sharpen is worse than outright lying, for if you have time to use a dull tool, you have time to put it in good order.

MANDRAGORA AS AN ANÆSTHETIC.

Medical writers from the time of Dioscorides down to the thirteenth century all bear testimony to the marvelous powers of Atropa man-

dragora or mandrake. In a review of the literature of the subject in the *Asclepiad*, Dr. W. B. Richardson shows how skillfully Friar Laurence described its effects to Juliet, modifying only the terrors of recovery from its influence as recorded by ancient medical writers. Since the middle ages, however, this drug has fallen into general disuse. Dr. Richardson having concluded to investigate its physiological action obtained well authenticated specimens of the root and prepared from them a tincture with strong alcohol. Obtaining no very characteristic effects from this he made a tincture by maceration with a menstruum composed of one part of alcohol and six of water. The product in this case was found to possess the most active properties ascribed to it by the ancients. The influence of mandragora upon the human subject was well marked. When the tincture was applied to the tongue it produced a sensation of numbness which lasted for several minutes. It communicated also a singular taste and sensation of acidity and dryness which lasted for several days. In doses not sufficient to produce actual narcotism, the symptoms induced were; desire for sleep, a sense of fulness in the vessels of the head, a peculiarly large and confused vision, an exaggeration of sounds and noises, an inaction of the bowels, with white, hard faeces when the bowels were made to act, and a singular restless and nervous excitability closely akin to hysteria. These symptoms were not totally removed for two days, and they left a lingering uneasiness and coldness for a much longer period. The whole of the facts indeed lead clearly to the acceptance of the belief that the medicinal use of mandragora in ancient times has been correctly recorded. The wine of mandragora, according to Dr. Richardson, appears to be a general anæsthetic of the most potent quality. The action no doubt depends on the presence of an alkaloid which is like, if identical with, atropine, and from it an alkaloid could be easily extracted which might be used medicinally, and which would probably be an active anæsthetic. From the circumstance that the heart continues to beat after the respiration has ceased, Dr. Richardson infers that as a general anæsthetic the alkaloid might under necessity, be employed, as was the drug in the olden time, to deaden the pain of a surgical operation, and that, too, with comparatively little risk of life. He also suggests that the alkaloid might be used for dilating the pupil as atropine is now used.

"One further fact," says Dr. Richardson, "struck me particularly in respect to the action of mandragora, namely, its powerful benumbing local action. On applying the tincture to my lips there was produced an insensibility which lasted for more than an hour, and was very decided. It is probable, therefore, that we have in mandragora a

good local anæsthetic, which, with all our advances, is still a desideratum."

BUCKTHORN IN TOOTHACHE.

Dr. Gretchinsky has called attention to a practice which obtains among the peasantry in some parts of Southern Russia of treating toothache with a gargle of decoction of buckthorn—*Rhamnus catharticus* (*Lond. Medical Recorder*, June 20, p. 241). He states that, in order to test the ground of this practice, he made a series of control experiments upon a number of inmates of the local prison who were suffering from toothache. The patients were ordered to gargle their mouths with the cooled decoction every three or five minutes until the pain disappeared, and in every case the suffering ceased in about half an hour, though there still remained a vague aching or kind of itching about the teeth. A prolonged anodyne effect was produced by inserting a cotton wool plug steeped in the decoction in the cavity of a hollow tooth. Dr. Gretchinsky considers his experiments proved decoction of buckthorn to be a reliable means for mitigating such dental pain as depends upon inflammation of the pulp. He recommends the decoction to be made by boiling 100 parts of the bark in water sufficient to yield 200 parts of the strained liquid and adding 10 parts brandy. Another writer attributes the anodyne action to the powerfully astringent properties of the decoction.

TOO MUCH FEEDING.

All the vital functions are more or less processes of combustion, and they are subject to laws similar to those which regulate the burning of coal in our fireplaces, The reason why we allow our fires to burn low or go out altogether, is that we put on too much coal, or that we allow them to be smothered in ashes. It is the child who pokes the fire from the top to break the coal and make it burn faster; the wise man pokes it from below, so as to rake out the ashes and allow free access of oxygen. And so it is with the functions of life, only that these being less understood, many a man acts in regard to them as a child does to the fire. The man thinks that his brain is not acting because he has not supplied it with food. He takes meat three times a day, and beef tea, to supply its wants, as he thinks, and puts in a poker to stir it up in the shape of a glass of sherry or a nip from the brandy bottle. And yet, all the time, what his brain is suffering from is not lack of fuel, but accumulation of ash, and the more he continues to cram himself with food and to supply himself with stimu-

lants, although they may help him for the moment, the worse he ultimately becomes, just as the child breaking the coal may cause a temporary blaze, but allows the fire all the more quickly to become smothered in ashes. It would seem that vital processes are much more readily arrested by the accumulation of waste products within the organs of the body than by the want of nutriment of the organs themselves.—*People's Journal of Health.*

ADMINISTRATION OF ANÆSTHETICS THROUGH THE RECTUM.

A London correspondent of the Philadelphia *Medical Times* writes: "Rectal alimentation being now a well established procedure, rectal medication appears to be attracting more attention; and I notice that satisfaction is being expressed by practitioners who have administered ether by this channel. The last report which I have seen is by Dr. F. H. Appleby, of Newark, who gave it to a woman, aged 29, with complete success. The operation was the extraction of twelve teeth. The dentist began to operate in four seconds less than eight minutes after the commencement of the administration. No more ether was given after the first ten minutes, but four teeth were extracted subsequently, the operation lasting fifteen minutes altogether. Six minutes later the patient was able to walk with assistance. The quantity of ether used was fourteen drams."

NUTRITION AND TEETH.

Dr. Norman Kerr, writing in the *British Medical Journal*, says that in the cities of the United States, where tea is consumed in smaller quantities than in England, the teeth decay more rapidly. The climate, the many indigestible articles of diet, the extreme nerve-ten sion of the Americans, and other causes affecting the nervine and general health of that people, tend to induce a dyspeptic condition which always seemed to him to be largely responsible for there premature dental decay.

At the same time there can be little doubt that the white bread and tea is a frequent cause of gastric trouble. Next to tea, alcohol, by its depravity of the digestive apparatus, has always seemed to him to interfere with tooth nutrition and soundness.

WHAT COCAINE TO USE.

There are many brands of cocaine in the market, and many physicians have found to their annoyance that some are inert and some very irritating when applied to a sensitive membrane.

It may therefore be of service to physicians to learn the experience of Dr. Dudley S. Reynolds, editor of *Progress*, who, in July ('88) number expressed himself in this wise:

"The medical profession has about settled its estimate of the therapeutical value of muriate of cocaine, but it is, unhappily, no easy matter to decide upon the most uniformly reliable source of supply. The editor of *Progress* had about concluded Merck's was the only reliable product, when recently he was induced to make a trial of that produced by Parke, Davis & Co. A fresh sample of ten grains was dissolved in five drachms of distilled water, to which was added one drop of liquid carbolic acid. One drop of this instilled into the eye of a man from whose cornea a foreign body was to be removed, produced complete anæsthesia in three minutes, so that incision of the inflamed cornea and turning out of the piece of offending metal was not felt by the patient. Twenty other similar experiments yielded similar results."—*Diatetic Gazette.*

A NEW TREATMENT FOR BOILS AND CARBUNCLES.

In a communication to the French Academy of Medicine, at a recent meeting, M. Verneuil says:

The topical applications (prominent among which stand the carbolated and borated solutions) employed in a certain way, and particularly in the form of powder used repeatedly and for a long time, are of remarkable efficiency and at the same time are absolutely harmless and easy of application.

These applications of powder quickly abort, with very few exceptions, boils and carbuncles. They arrest the progress of the disease in the gravest cases, ordinarily cause the pains to quickly cease, reduce the fever, disinfect the purulent and gangrenous centres, hasten resolution, and promote the formation of healthy granulations.

This treatment is suitable for all regions, and for all forms and periods of the disease. It is never harmful, and leads to a cure in a large number of cases. It assists surgical interference when that is necessary.

Finally, it tends to prevent auto-inoculation and general infection. —*Scientific American.*

LIME WATER IN DIPHTHERIA.

Lime water is an admirable remedy in case of diphtheria. Its local effect is most useful in cleansing and purifying the fauces, and its mode of application is the easiest imaginable. It requires no spray

apparatus, no douching, and no effort at gargling. It is sufficient to have the patient slowly swallow a teaspoonful or more every hour, in order to get good results from its use. This fact is of the greatest importance in treating children, who are too often cruelly tortured in the attempt to make local applications to the throat. Lime water can be given easily, and is taken readily by children; and there are, we believe, few cases of diphtheria which requires a more energetic local treatment than the one just described. In fact, we think that an early clearing out of the bowels with calomel—sometimes in massive doses—followed up after a short interval by the administration of lime water and the use of a suitable tonic and roborant regimen, constitutes a method which comes the nearest to being of universal applicability of any one with which we are familiar; and we think that the use of the lime water is of more consequence than any other part of the treatment, except it be the preliminary purgation.—*Med. and Surg. Reporter.*

A new process for preserving liquids in arresting fermentation has been introduced and is now at work in New York. Briefly described, the new process consists first in exhausting the air from the fluid and substituting in its place carbonic acid gas. Beer, fruit juice, wine, cider and milk can be kept in an unfermented state for any length of time by this process. One of the practical and valuable features of the process is that all the liquids named can be put up in siphons and supplied in the most convenient form to the consumer. The latter can then use any desired quantity of the contents of the siphon, and keep the remainder intact for future use. For invalids and those who do not care to use alcoholic liquors, the process permits the pure expressed juice of the fruit being preserved with its natural flavor bouquet. The value of pure carbonated milk for ready consumption will also be appreciated by physicians.

To the Editor of the Dental Review:

DEAR SIR:—The best method I have found for expanding the inferior maxilla as required in regulation cases, is the following: I think its chief merit lies in its simplicity, and ease of construction. Having secured a model of the lower jaw, I take piano wire of a suitable size and after leaving about an inch straight on the end I bend it with a pair of clasp benders, so it forms what looks very much like a lot of U's joined together.

The length of the curves is determined by the length of the teeth and depth of the gum; after the wire is convoluted, adapt it to the arch, wax up the caps over the molars and bicuspids, leaving the cuspids and incisors perfectly clear, flatten the ends of the wire or bend it as taste may indicate and insert in the wax and it is ready for the flask. Before investing see that the wire does not approach either teeth or gums closer than a sixteenth of an inch, or when it is stretched to produce expansion it will press upon the soft tissues and cause much pain. I find this kind of a case does not interfere with the speech as much as others do, and the rapidity with which it performs its work is quite equal to the Coffin pla'e.—*W. Mitchell, D. D. S. in Dental Review.*

SACCHARIN—CONCENTRATED SWEETNESS.

Of the several recent products of chemistry none is more interesting than "Saccharin." This new substance, were it not for its expensiveness, would soon supplant sugar for manufacturing and domestic purposes. As it now exists it is highly recommended for use by dyspeptics and diabetic patients, from the fact that it does not undergo fermentation, and is eliminated from the system unchanged. Saccharin is now being largely introduced in London as a substitute for sugar, which purpose it answers admirably, being according to actual experiments, three hundred times sweeter than ordinary sugar. According to Dr. Hare, of the University of Pennsylvania, "Saccharin" is a coal-tar product of an exceedingly sweet, persistent taste, so strong that one atom of it will produce a decided and lasting sweet taste in the mouth. It may be used in very minute dose, owing to its extreme sweetness as a substitute for sugar. It is too expensive to permit of its use as an adulterant.

It would thus seem that coal is of greater utility than simply as a fuel, for we now have another wonderful product added to the many already obtained, which have proven of such inestimable service to mankind. As it does not undergo fermentation it is especially commended, as not injuring the teeth.—*Dental Headlight.*

THE CARE OF THE NAILS.

Very few people know how to properly care for the nails. In cleansing them a sharp knife ought never to be employed, but between the ends of the nails and the fingers the space should be filled with soap, and then removed by brushing with the so-called nailbrush. Many improperly cut away that part of the flesh which grows

over the nail from the bottom; but it should be simply pressed backward, and sufficiently to show the white part, considered by some to be a mark of beauty. If the flesh is adherent to the nail, the operation may be facilitated by passing the sharp point of a knife underneath the fold of flesh and separating it from its attachments. With this done, it can be pushed back more readily. Scissors should never be used to cut the nails; that should be done only with a sharp penknife.—*Boston Journal of Health.*

TOOTH PASTES.

Tooth pastes consist essentially of an insoluble powder such as constitute the ordinary tooth powders made into paste with some excipient and flavored to suit the taste. The solid ingredients should be first reduced to an impalpable powder and thoroughly mixed before the addition of the liquid. The liquid or excipient used may consist of glucose, syrup, honey, glycerin or a mixture of some of these with each other or with water. The objection to syrup is its tendency to dry out and crystallize; the same tendency, though to a lesser extent, is shown by honey. Glucose has a tendency to fermentation, which is a strong objection. A mixture of glucose and glycerin is not open to this objection, however, and forms an excellent excipient when diluted somewhat with water, the best proportions for general use being as follows:

	Parts.
Glucose	8
Water	1
Glycerin	1

As stated above, any tooth powder may be transformed into a paste by adding a sufficient quantity of excipient.

In preparing charcoal tooth pastes, care should be taken in the selection of the charcoal, that from heavy, close grained, hard woods being preferable to the lighter varieties. Some manufacturers are said to go to the trouble of having the charcoal burned expressly for this purpose. The "cylinder" charcoal of the gunpowder manufacturers is of better quality and more suitable than some of the powdered willow charcoal found in the trade. That most highly esteemed, however, for this purpose, particularly in the East, is areca-nut charcoal.

We give below several formulas gathered from various sources, among which our correspondent will no doubt find one that will answer his purpose:

CARBON TOOTH PASTE.

	Parts.
Levigated pumice	32
Cylinder charcoal	32
Prepared chalk	32
Cochineal	3
Cloves	3
Cologne, sufficient.	
Excipient, sufficient.	

ANTISCORBUTIC TOOTH PASTE.

	Parts.
Prepared chalk	8
Myrrh	2
Rhatany	2
Cuttlefish bone	2
Orris root	1
Excipient, sufficient.	

PERSIAN TOOTH PASTE.

	Parts.
Cloves	50
Cinnamon	50
Orris root	100
Precipitated chalk	200
Powdered soap	80
Carmine	5
Ammonia	1
Excipient, sufficient.	

Where "excipient" is directed in the above formulas any of the substances mentioned as such, or any combination of them may be used as the manipulator may desire. Where cuttlefish bone is directed the interior portion only should be used, the hard outer shell being discarded.

The aromatics given in the formulas may be omitted or other flavors may be substituted for them if desired, but if any substitution is made, the fact should be borne in mind that insipid or purely sweet flavors are not so apt to become popular as those having a more or less aromatic character.

It should be added that while there is a popular idea that charcoal is a valuable dentifrice it is not always satisfactory in practice. Where the gums are spongy or the user not very careful, particles of carbon may find a lodging.—*S. W. J.*, Toronto, in *Druggists' Circular.*

A NEW TOOTH WASH.

The root of geranium suelda (Bolivia), dried and coarsely powdered, is steeped in twice its weight of 98 per cent. alcohol, thus affording a fine, red tincture. Ten drops of the preparation in a glass of water will make a mouth-wash surpassing anything known. It may also be applied with great benefit to decaying teeth with a little pledget of cotton.—*Ch. and Dr.*

A FEW COMMON TECHNICAL TERMS AND THEIR DEFINITIONS.

Hyper—Above, excessive.
Hypo—Under, beneath, deficiency.
Epi—Upon, on.
Itis—Inflammation.
Disease—Alteration of nutrition.
Etiology—Cause of disease.
Semiology—Phenomena of disease.
Vorology—Classification of disease.
Diagnosis—Distinction of disease.
Prognosis—The foretelling of the course and termination of disease.
Prophylasis and Hygienics—Prevention of disease.—*The Record.*

ANATOMY—PROTOPLASM.

The derivation of these words is from *ana*, "up" and *temnein*, "to cut"—to cut up or dissect. "Protos," first, and "plasso," to form—the first form of living matter.

FOR TOOTHACHE.

The following is recommended: Ricinated collodion (collodion with which castor oil has been mixed to make it flexible), and crystallized carbolic acid, in equal parts, are put into the cavity, and a bit of cotton placed over the mass and left long enough to protect it from the saliva. It frequently relieves pain instantaneously.—*Pac. Rec.*

KEEP POSTED.

Dr A. Holbrook says: With the aid of innumerable societies scattered over the land, the score of dental journals at prices within reach of all, and easy access to busy, earnest brother workers, there is no excuse or palliation for any dentist who will not keep himself posted in all that is being done in his special calling.—*Dental Review.*

OIL OF TURPENTINE.

Dr. Love says: A point important to keep in mind is, that the oil of turpentine—cheap and always within reach—is one of the most valuable remedies in the materia medica, as a local and general stimulant, as a germicide and preventer of fermentation, and last, but not least, internally administered, as a checker of bleeding.—*Med. Register.*

ROOT CANALS.

Dr. Louis Ottofy, writing on the above subject, strongly deprecates *the reaming out of root canals* except for dowels in crowning. He thinks the excessive use of the Bichlo Mercury is objectionable from the tendency of this solution to corrode fine broaches. He speaks of favorable results, in the treatment of root canals, with the use of *the oil of cassia* suggested by the experiments of Dr. G. V. Black. To find root canals, which is often difficult, he recommends the free use of some diffusible essential oil in the nerve chamber, as eucalyptol, and making another appointment, when the canals are much more readily found. He suggests the use of two or more broaches, leaving one in the canal found and seeking for the others with a stiff, fine broach.

GERMICIDAL PROPERTIES OF COPPER AMALGAM.

Dr. W. X. Sudduth says: I have made a few tests in that regard and my judgment is that its germicidal properties are very low indeed. Certain conditions may be brought about by which chemical changes will take place, and in that case it may have slight power as a germicide; but as a dependent I think its value is more due to its adaptability and non-shrinkage, by which it forms a perfect stopping for teeth, thus preventing entrance of the micro-organisms into the cavity. —*Ind. Prac.*

DIGITALIS AND CHLOROFORM.

Dr. Louis Lewis says: A dose of digitalis, given immediately before the administration of chloroform for operations, would, it appears to us, act as a prophylatic by causing better contraction of the ventricles and steadying and regulating the pulse. In cases where the heart is known to be weak, the tonic action of digitalis might here possibly avert a calamity; and certainly in a judicious dose could effect no harm. Its beneficial action on the "shock" produced by the operation is also worthy of consideration.—*Med. World.*

PULMONARY HYGIENE.

Chest gymnastics are of undeniable utility to flat-chested people, round shoulders, and to those in the incipiency of phthisis. By these exercises full inspirations are established, and the least available parts of the lungs—the apices—receive their full compliment of air, and are stimulated to throw off any existing infiltrated products. Lung diseases usually commence at the apex, through the peculiar anatomical disposition of the parts, which exposes the centre and base of the lung more freely to the action of air than the apex.—*Med. World.*

GOLD SOLUTION.

Dissolve the gold in *aqua regia* (one part nitric to two parts of muriatic acid); evaporate nearly dry; dilute with water; precipitate the gold with aqua ammonia; take up the precipitate with cyanide of potassium, ½ oz. to 1 dwt. of fine gold; filter clear; the plate to be gilded is first to be polished and washed perfectly clean; after washing do not touch it with the fingers; put it in the fluid and place a strip of zinc against it; when coated with the brown precipitate remove, wash and polish. This process may be repeated several times, until the desired color is reached.—*Western Dental Journal.*

NICKEL PLATING SOLUTION.

According to the *Bulletin Internationale de l'Electricite*, the following solution is employed for nickel plating by several firms in Hainault. It is said to give a thick coating of nickel firmly and rapidly deposited. The composition of the bath is as follows:

Sulphate of nickel	1 lb.
Neutral tartrate of ammonia	11·6 oz.
Tannic acid with ether	0·8 oz.
Water	16 pints.

The neutral tartrate of ammonia is obtained by saturating tartaric acid solution with ammonia. The nickel sulphate to be added must be carefully neutralized. This having been done, the whole is dissolved in rather more than three pints of water, and boiled for about a quarter of a hour. Sufficient water is then added to make about sixteen pints of solution, and the whole is finally filtered. The deposit obtained is said to be white, soft, and homogeneous. It has no roughness of surface and will not scale off, provided the plates have been thoroughly cleaned. By this method good nickel deposits can be obtained on either the rough or prepared casting, and at a net cost which, we are told, barely exceeds that of copper plating.

[*From the Philadelphia Press.*]

THE BEGINNINGS OF BEAUTY.

How to Train Children to Eat Properly and Keep Excellent Teeth — Shirley Dare's Good Advice — Necessity of Supplying Growing Young Ones with Ample and Nutritious Food—Stunted Bodies and Minds from Semi-starvation.

Of the child of good family to-day it can be said that it is well kept, well curled, dressed like an actress if not like a picture, and behaves marvelously well in society, or as people used to say "before folks." Its drawings and needle work are handed round, as a credit to its kindergarten, it models in clay, putty and pulp, can give a concise account of the Indian question, the prohibitory law, silver money, women suffrage and Protection. Between its public school cram, the juvenile publications and reading clubs there is very little in heaven or earth not touched in its philosophy. Still experience in the person of the much-enduring mother, if she has some sort of sense, finds things overlooked which used to be considered as essential as clean face and finger nails. I do not refer to the inability of prize pupils to repeat common rules of arithmetic or any science correctly, or to the trips in spelling and speech which require an educational nursemaid at hand the greater part of their career.

But the boy and girl who lead their classes in school and their circle out of it, are apt to have defective teeth, in sad want of filling and anything but ornamental at the best of times. This comes from not knowing what to eat, and how to eat it. How many parents think of teaching children how to eat, though it is the most important of physical lessons. A child needs to be taught to use its teeth with the same attention given to handling its spoon, which it is shown with care lest its manners fall under criticism.

THE IMPORTANCE OF DIET.

If diet is right from the beginning, the first teething will be painless, and the second, in later childhood, will be without the ordeals of tooth pulling, or the disfigurement of empty gums waiting for the new set to take its place. The teeth are in the gum when the child is born, but take their time to push through, according to its vigor and the quality of its food. In the natural order of things, the root of the first teeth are absorbed, and the tooth drops out just as the new one is ready to take its place. With due care the agonies of toothache

and dreaded visits to the dentist should be struck from the list of childhood's memories, as wholly unnecessary and unknown This will be to the relief of parents as well as the boys and girls themselves. Fine teeth are a grace which every child should have if its early care and training are what they ought to be. This the parent must see to, personally, and daily, for it is the most difficult and important thing in the child's whole physical training. It can not be left to nurse-maids, or persons who take the care of children in the country or school, for not one in 10,000 has any idea of how a child should be taught to eat, or will take the pains to teach it. The beautiful little first teeth are for show, not for use, unless biting his rubber ring until the double teeth come, four on a side. Giving solid food to a child before he has tools to grind it is ignorant barbarism, causing more suffering, and crossness, and more downright ugliness of looks than any other mistake of its early training. Besides the often fatal indigestions, fits and lasting feebleness, produced by such feeding, the teeth are injured in forming, decay early, and are almost sure to grow irregularly for the second set, and certain to be yellow or black, beyond the power of any powder to whiten them.

Fine cracked wheat or granulated oatmeal with milk or broth should be a child's first change from wholly milk diet. They are the most satisfying food during infancy and childhood, furnishing the substance for teeth, bone and muscle, clear eyes and exquisite skin. For a long time, up to the twelfth year probably, the first of a child's meal should be liquid or semi-liquid food, milk, soup, broth, farina and milk or syrup, as it soonest appeases the sharp edge of hunger and gives the stomach aid to dispose of more solid food. The hunger of children is a sharp reality and they grow faint with it very soon. Their systems are busy manufactories, making growth of bone and muscle, growing before they are 17 more than they do in all the fifty years of life after, beside their ceaseless activity, which knits and settles the new-formed tissue. If the supply of food is not prompt and satisfying, the waste is immediate and injurious, for the vitality of children is quickly spent. It is not only cruel, but harmful, to force them to go without eating as long as grown people are expected to. The old rule that children should never eat between meals should be amended to the effect they should not eat within three and a half or four hours of a full meal.

EAT FIVE TIMES A DAY.

It is very much better for young people till well in their teens to eat five times a day than three, eating lighter meals, which tax the digestion less. It is time the principles of nutrition were better under-

stood, and first of all that people and children differ about food. Some middle-aged folks do well, or think they do, on two meals a day. The ignorance and mistakes in feeding children, appear little short of diabolical in their intent and effects. It is a far cry from the stupid untaught mother who feeds her nursing baby at the table with sausage, baked beans and pickle, varied with sips of strong coffee, to the painfully well-read mother who nearly banishes pleasure from her children's lives for fear of possible injury. Fifty years ago and more the idea prevailed that porridge of flour and milk was remarkably wholesome for children. A more abominable mess, both for taste and nourishment, is hardly advisable, and I have a private belief that the melancholy dyspepsia of memoirs of the time was cultivated by this diet. Harriet Martinau records her childish sufferings from indigestion caused by this unpalatable food, and there is little doubt that the deafness which was the clog on the brightest intellect among women of the time grew out of the nervous derangement from improper food. Charlotte Bronte wrote vigorously of the scanty, limited fare at Lowood School, which dwarfed her own growth and left her after years a prey to horrors of imagination which were like the shadow of death, and finally led to the malady which tore her from life and affection just as she began to be happy. Dickens was undersized all his life for want of generous food when a growing, craving boy—and he might well have lived a score of years longer if he had banked a little more fresh air, fun and beefsteak pudding when he was the boy in the blacking factory.

I know how absolutely fathomless and insistent a boy's appetite is and a girl's may be, when growing, and how, devouring a Thanksgiving dinner daily at 1 o'clock, they are in the pangs of starvation before 6. But all this food is so much strength put in bank for them against mid-life, when they begin to feel the want of it. If you would know the cause of many a dissipated life or early paralysis in men, the racking nauseas of prospective mothers, the utter uselessness of many women after 45, it would take you back to the years between babyhood and the latter teens, when unsuitable or stinted food laid up defective muscle and nerve-energy instead of stout heart and fibres of iron—for flesh and blood must bear more than iron before its work is done.

SCRIMPED FARE.

It seems hardly necessary to adjure parents to give their children enough to eat, but the medical societies speaking loudly of the want of nutrition, as next to lack of pure air, the great evil they have to contend with in general diseases. And the trouble begins with chil-

dren. The table is scrimped in too many middle-class families for the sake of assumed gentility and cheap decorative art. I know many a wellkept house where neither child nor hearty grown person could keep strength a year on the ordinary fare. A single egg and slip of toast for a breakfast, or perhaps two griddle cakes—only two—and a cup of cocoa, is no sort of living for a growing child. It is no wonder people in general amount to so little, considering how meagerly they feed. "We never have anything at home for dinner but beefsteak and apple pie, the year round," said a young matron at a Summer resort. "Bridget doesn't know how to cook anything else and I let her go on that." Yet she had five young children and counted up the dozens of embroidery she did in a year as presents to friends. One must think of Master Reginald Bazalgette who runs away from home on hearing there is to be the same roast mutton and rice pudding for nursery dinner that he has eaten for years. The cottage dinners which look so pretty with etched doileys and flowers and wafers tied with ribbon, would hardly satisfy a schoolboy if he ate the whole down to the hearty dessert of charlotte russe and salt almonds. Americans with their way to make in the world need more ballast than the dainty *plats* of three chicken wings and a spoonful of sauce which figure in amateur housekeeping articles. Give your boys and girls Miss Parloa's matchless Indian puddings and Marion Harland's generous good things, and Miss Corson's savory entrees and let the fancy dessert go by.

What children shall eat is the parent's business. How they shall eat they must learn for themselves. Learn they must, and all human beings must, to eat leisurely and grind the food thoroughly. They learn this by having very hard crackers in place of bread, which are uneatable save as slowly ground by the teeth. There is a unique device for babies, invented by a physician, of a teething cracker, of fine wheat meal, ring-shaped, too large and too hard to swallow or bite, but which baby can shave down with his new front teeh. Let him graze on such bread stuff for three years and he will have a very accurate notion how to use all his teeth. Hard gingerbread and crisp candy are good chewing lessons, later, and a bit of tough savory beef will teach him Mr. Gladstone's thirty-two bites to a mouthful and some over.

PLAYING HOW TO EAT.

The nurse should make a play with the child of seeing which can chew longest on each mouthful, doing it very nicely with shut lips—all training in eating being given after first hunger is satisfied. Let a little one play between whiles at meals two or three minutes, to al-

low leisurely beginning at digestion. The license of a French family meal is a good thing, socially and physically. The chatter, the laughter, the breaks by way of practical joking give chance for the best possible state of interior affairs, and it is no hazard of good manners for one to rise, glass in hand, and take a turn about the room between courses, or to break out in a verse of a song. What an immorality the Anglo-Saxon code would make of a cheerful outbreak like that!

The hurried breakfast and lunches of school children and lads just entering business lay the foundation for a good deal of weakness and dyspepsia in after life. The sleepy child must hurry through a trim toilet, presentable in public, hurry through breakfast with one eye on the clock, in dread of being late, which drives away appetite, bolts the morsels almost whole, and runs for street car or train half satisfied. At noon, half an hour for lunch and fresh air is a larger allowance than many public schools afford. A pastry lunch, swallowed in a gloomy basement in the fifteen minutes recess, with all the stress and anxiety of lessons full on the mind, accounts for not a few of the mysterious breakdowns just after graduation. I do not know what will be done to avoid it. We seem to be hurrying our children off the face of the earth, first in school, then in business. But they must be taught, as they value their lives, to eat what they do eat, and grind it thoroughly, as the preventive of digestive misery and death.—*Shirley Dare.*

VACUUM CAVITIES—A NEW IDEA.*

Every mechanical dentist has, at some time or other, been exercised over the question as to the best method of constructing dental plates which are to be retained by atmospheric pressure. Shall he make vacuum cavities, or rely on what Harris calls the "adhesion of contact"? It is still an open question, since our best men are divided in their opinions upon this point. The conscientious workman will have to be guided, finally, by his own personal experience. The conclusion I have at present reached is this:

In a certain percentage of mouths an accurately fitting plate will have sufficient adhesion by simple contact. In my own work, I should estimate that this is the case in perhaps one-third of the mouths I have to fit. In the majority of mouths, owing to shape and still more, to varying texture of the mucous membrane, the case is otherwise. We all know the arguments advanced by competent men on either side of the question. Without repeating them, I may say that the vacuum cavity is of the utmost assistance and comfort to a beginner, to the unfortunate who wears a plate for the first time. During the first few weeks its value is great enough to outweigh its disadvantages and defects. Nevertheless, I use this method under protest, having a great objection to the congestion (sometimes hypertrophy) produced by the cavity. Consequently I experimented with Dr. Spyer's cohesion forms, hoping to find in them a solution of the difficulty. In my hands they were not a success. First, because I never

*Read before the South Carolina Dental Association at Greenville, July, 1888.

succeeded in fitting a "form" upon the model without cutting and mutilating it. This agrees with the experience of every dentist of my acquaintance who has tried them. Secondly, because the "form," if left on the vulcanite plate, turns black and becomes unsightly. If it is stripped off, the plate is too large by the thickness of the form.

Borrowing an item from the said cohesion forms, I hit upon a device which I beg leave to describe. Some members present may think it worth trying: I take it for granted that every one, now a-days examines the mucous membrane with the finger and mouth-mirror, noting the various hard and soft surfaces, scraping the impression where the hard points come and the model where the soft parts are located, leaving, however, a narrow band untouched where the heel of the plate will come. Having given great care and attention to these points, I take some of the smallest sized, round-headed gimp nails (a larger size will not answer). As soon as the model is separated from the impression, and before the plaster becomes thoroughly hard, I press a number of these little nails into the model, covering as much of the palatal surface as I choose. A few marks with a lead pencil enable me to place them regularly. They are tapped down closely, and the case is carried forward in the usual manner. Before putting the rubber into the flask, a coat or two of liquid silex, diluted, should be carried over the model with its little projecting nail heads. There is no further work or trouble about it, and no more time is taken up than is required by the adjustment of a vacuum form. A good, strong adhesion is the result, and no unpleasant results follow

So far as I know, this plan is new, at all events it is original. I may add that it will work as well with cast plates as with vulcanite, and is serviceable in lower plates as well as upper.

[This interesting paper appears anonymously because no name appeared on the manuscript. We did not discover it in time to write for the author's name. Papers, whether written for a journal or association, should always have a title and the author's name.—Ed.—*Southern Dental Journal.*

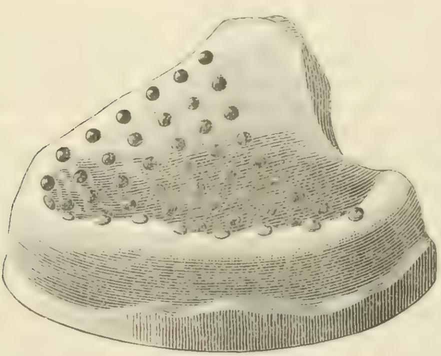


Fig. 48.

The above description is so clear, that it would seem scarcely to need a cut to make it more comprehensible; yet as the plan is feasible (and we have tried it with satisfactory results), we present a cut of a model prepared as above described for such as may need more explicit directions. Should there be a hard ridge along the median line, the tacks should not be put on this hard line but on each side of it.—Ed

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FILING TEETH.

BY M LUKENS LONG, D. D. S., PHILADELPHIA, PA.

By the judicious exercise of a little artistic taste, the *file*, so often used to mar the beauty of the teeth, may be made to improve their appearance, and to give a more pleasing expression to the mouth. A little alteration in shape or length, rounding a sharp pointed canine, shortening a central incisor to match its mate, dressing down the inferior incisors where the superior by direct occlusion have worn the cutting edges into unequal lengths, where a lower, a little in front of the line, meets an upper incisor squarely on the edge, wearing it away and making it shorter than the others. If the person be too old to have the irregularity corrected, it is better to sacrifice a portion of the lower than to allow a disfigurement that is continually growing worse. Where the laterals have been lost and the cuspids have taken their places the doglike expression of the mouth may be remedied by shaping the cuspids to resemble laterals. There are many little points where the æsthetic dentist may assist nature, where she has fallen a little short of her mark.

In striking contrast was my own experience forty years ago with a dentist, who was not æsthetic, but as good as the average at that time. The superior oral teeth were filed with such wide separations that they looked like an old coarse comb. The mesial corners of the centrals were rounded off like a cutaway coat, the teeth were irregular in length and were allowed to remain so, giving a hideous expression to the mouth. To fill approximal cavities in the inferior molars on each side V shaped separations were made rendering them entirely useless for mastication or worse than useless, as all know who have experienced a similar infliction. After a few pieces of meat, or of some hard food, became impacted between the teeth, and pressed on the gum, the pain was often so great, that it was impossible to close the teeth together, making it necessary to swallow the mouthful without being properly comminuted. If any portions of the food are allowed to remain be-

tween the teeth, the continued pressure will cause periosteal inflammation and keep them constantly in the condition of teeth wedged apart for filling or for examination. But we soon learn to keep the food away from the dangerous spot and if any antagonizing teeth can be found in another part of the mouth they are compelled to do all the work, while the "self cleansing" spaces can quietly rest and become covered with tartar. Is "saved" the proper word to describe a tooth that is a constant source of annoyance? Would not "spoiled" come nearer the correct meaning? "A self-made country doctor had heard of operations being performed for the cure of strabismus. A patient having this defect applied to him for treatment," he afterwards boasted of his success by saying "I may have spoiled the sight of the eye, but I cured the squint.'"

Which is best, to have a squint or to lose the sight of the eye? And thus is it with teeth that are injudiciously filed—we may preserve the teeth but mastication is torture with them.

There is a class of teeth occasionally presented to us for treatment in which, from defective nutrition during some of the diseases incident to childhood at the time of the calcification of the enamel, the dentine is exposed on portions of its surface. If severe sickness should occur about the second year of the age of a child, the cutting edges of the incisors may be entirely devoid of enamel or so pitted in structure and uneven in form as to render them difficult of preservation. In such cases the removal of the imperfect portions by filing them away, would be better than to attempt to fill all the pits and depressions.

If from protracted illness at five years the part of the incisors near the gum should be destitute of enamel and the dentine sound and not discolored, the thick abrupt edge of the enamel may be filed down and shaped in a proper form to prevent a lodgment of food.

(I am indebted to Prof. C. N. Peirce for the time of the calcification of the enamel.) If the enamel is wanting on the first molars and for some good reason it is desirable to try and save them, the cusps can be filed down as much as possible without endangering the exposure of the horns of the pulp; the whole crown may then be rounded and made self cleansing.

Transverse ridges on the enamel, if the depressions between them are not too deep, may be filed and polished, and the patient should be directed to use the brush down on the upper, and up on the lower teeth, instead of across. As the enamel is not as perfect under the depressions, the tendency by such brushing would be to wear it away in grooves as it was before.

If the part of the tooth to be removed is quite thick, cut a line nearly through the enamel outside and inside and remove with the excising forceps. A cuspid tooth when cut off will have the appearance of standing out beyond the line, and it may be filed in front to give it the proper shape to correspond with the others.

Denuded dentine on the grinding surfaces is seldom seen in middle life as the structure is not sufficiently dense to withstand the wear of mastication, and in consequence of its disappearance, some have erroneously been led to believe that the exposed dentine has been covered with a new growth of enamel. Teeth will not always follow the rules governing their formation, and instead of showing lines of defective calcification in the parts where we would naturally expect them to be perfect, we occasionally find them running regularly around the teeth as if they had all been formed at the same time, or from some cause had become changed to that condition after all the teeth were erupted. The enamel in such teeth presents a very different appearance from that affected by erosion, which sometimes eats away perfectly formed enamel, but in the cases referred to there is no sign of their being affected in that way. On the contrary, the teeth are apparently in a healthy condition.

When teeth are very sensitive after being filed, rub the filed surface with a very hot burnisher, or what is much better, use Dr. Register's hot air blast, until all the fluid in the tubuli that convey sensation to the pulp, is driven out; then apply creasote on a pledget of cotton for a few minutes till the dentine becomes saturated with the escharotic.

The best "file" for trimming off the cutting edges of the oral teeth is a thin corundum disk about three quarters of an inch in diameter. The handpiece should be held on a line with the tooth, the hand resting on the chin of the patient. Great care must be exercised to prevent making the tooth too short as the disk has a tendency to cut toward the gum and it is best to commence nearer the edge and if necessary a little more can be taken off afterwards.

Of course it would not be proper to file all imperfect teeth, but only those that in the judgment of the dentist would be benefitted by the operation. To ride the file as a hobby, might be the means in many instances of inflicting great injury. Patients express very different opinions in regard to filing teeth, one will say, "Whenever I look at my teeth in a mirror I feel very grateful to you for making such a wonderful improvement in the appearance of my mouth." another will say, "Whenever I take a drink of cold water I feel like murdering you."

The physician who fails to correctly diagnose a case of disease will have the recuperative powers of nature to overcome the bad effects of wrong treatment, but the human economy is unable to correct the mistakes of the dentist and the "spoiled" tooth may last through a long life to torment its possessor.

VACUUM CAVITIES.

The article entitled "Vacuum Cavities" which we re printed from the *Southern Dental Journal* in our last (March) issue at page 63, and gave a cut at page 64, to still further exemplify the "new idea" is from the pen of Dr. Alfred Peete of South Carolina. It was published in that journal anonymously; but we are advised by Dr. B. H. Catching, the editor, that to Dr. Peete is due the credit of the conception.—Ed.

THE PRACTICAL PLACE.

ANTISEPTIC TOOTH-WASH.

At a recent meeting of the Odontological Society of Pennsylvania, Leffmann reported his experience as follows:

Several formulæ for antiseptic tooth-washes have been offered as fulfilling the indications here referred to, and, with a view of testing the practical value of these, I made up two forms, and present them for consideration by the members. In my opinion they are both rather too strong, and can only be used very much diluted with water. This will, of course, interfere greatly with their antiseptic effect. Besides this, they are necessarily retained in the mouth for a very short period, and even if we suppose that they penetrate into all parts of suppurative structures, they do not remain long enough to do any good. I give herewith the two formulæ, both of which I have used, and find the first the more agreeable:—

Thymol,	4 grains.
Eucalyptol,	220 grains.
Benzoic acid,	45 grains.
Alcohol,	3 fluid ounces.
Oil of wintergreen,	25 drops.

Use a teaspoonful in about three tablespoonfuls of water as a wash.

Thymol,	20 grains.
Glycerine,	1 fluid ounce.
Alcohol,	1 fluid ounce.
Water,	enough to make 1 pint.

Use as above.—*Dental Cosmos*, Feb., 1888.

CLEANING TEETH.

Having removed all the calculary deposits, the polishing with the pumice powder comes next. The wetting of this with hydrogen peroxide instead of water has been found of great value.—*Dr. M. L. Rhein, in N. Y. Society.*

Dr. W. H. Morgan says that all dentists should not be physicians, for that would wipe out the dental profession. It is a battle that has been fought for fifty years. Medicine is based on theory, but dentistry is based on demonstrated facts.

DRILLING PORCELAIN TEETH.

A cavity may be prepared for filling in a porcelain tooth by the following simple process :—Grind out a smooth surface with a small corundum wheel, to a depth corresponding to the coaptation of spherical surface of the wheel. Invest the tooth in plaster so as to hold it firmly, and then sharpen a small engine bur to a point one thirty-second of an inch across. Light blows with this, turning it at the same time after the manner of the sculptor, previously wetting the cavity with a mixture of the spirits of turpentine and camphor, and keeping it so, will enable you to drill a hole in each end of the oval cavity and connect them for filling with the greatest of ease.—*F. B. Buck*, Jacksonville, Fla., in *Cosmos.*

COPPER.

Has the reputation of being a great consideration as a component of dental alloys. I am of the opinion that this will prove to be another fallacy, though I confess it is a little hard for me to give up my prejudices in favor of it. It is unquestionably true that alloys made without it do most excellent work, and, moreover, they show, if heavily silvered, the same effects which have been so generally credited to copper.—*A. Morsman in Archives.*

UNIVERSAL ANTIDOTE.

A universal antidote is made by mixing equal parts of calcined magnesia, powdered charcoal, and hydrated oxide of iron. The mixture is simple and harmless, and is given in cases where the poison is unknown.—*Med. Brief.*

TO OBTAIN A SMOOTH MODEL.

Dr. Morgan says :—If after varnishing an impression with shellac,it be dropped into a bowl of warm water and allowed to remain some minutes before pouring plaster into it, the resulting model will have as smooth and good a surface as when metal is used.

DR. M. CHAS. GOTTSCHALDT, NEW YORK CITY.

Those having trouble with the sand paper or corundum disks catching the rubber dam while using them, will find the following of advantage: Keep a cake of toilet soap on the operating stand, and before using the disk, run the edge once or twice over the dry soap; this will give a smooth edge; which will glide over the dam without any trouble.

NAPHTHOL AS AN ANTISEPTIC.

Dr. Bouchard, of the Paris Academy of Sciences [*Pharmaceutische Zeitschrift*] strongly recommends naphthol as an antiseptic, especially for the disinfection of parenchymatous tissue and cavities which are only reached with difficulty. He recommends it for the following principal reasons :

1. It is only slightly soluble, and in the above cases insoluble antiseptics are preferable to those that are soluble, as they are not absorbed, and so do not affect the general organism, but still make the fermentation or growth of micro-organisms locally impossible.

2. It is five times as active as carbolic acid, three times as active as creosote, and is superior to sublimate, which is ten times as active as naphthol, because it is one hundred and eighty-seven times less poisonous.—*International Jour. of Surg. and Antiseptics.*

ARTICULATING ARTIFICIAL TEETH.

I wish to emphasize the vast importance of the word *articulation*, as applied to the closure of artificial teeth. More depends on it than anything connected with the success of artificial dentures. Many a denture, right in every other particular, is entirely wrong in this, and consequently a source of discomfort to its wearer.

Three rules cover essentially the ground. Never allow pressure on the six anterior teeth; never, in full upper plates, allow the pressure to be greater on one side than the other; never allow a second or third lower molar which has projected forward so that its face shows to meet an artificial tooth at that angle, as it will surely crowd forward the upper plate, the same as the meeting of the anterior teeth.

As a rule, a full lower plate is more comfortable and useful than a partial, because the pressure is distributed equally over the whole jaw.—*Dr. L. P. Haskell.*

PAINLESS TOOTH EXTRACTION.

Drs. Henoque and Fredel, in a communication made to the Biological Society of Paris, states that the extraction of a tooth may be rendered painless by spraying the neighborhood of the external ear with ether. The anaesthesia of the trigeminus so produced extends to the dental nerves, and thus renders the production of general anaesthesia needless.—*Medical Record.*

CLOTH STRIPS FOR POLISHING.

Dr. Charles T. Howard has just put on the market four grades of strips for finishing or polishing proximal fillings and surfaces, that should be given a trial by everyone capable of appreciating a good thing. Their points of superiority are extreme thinness combined with great strength, while possessing to a high degree the other qualities necessary in good strips. They are made in four grades—coarse, medium coarse, medium, and fine; and in three widths—broad, medium and narrow. The samples are medium width. They are put up in packages containing an amount equal to one gross of medium width, and at fifty cents per package. To be had of dealers, or direct from the manufacturer, whose address is Rochester.—*The Odontographic Journal.*

COCAINE IN DENTITION.

M. Viguier has proposed the following to relieve the pain which children suffer when cutting their teeth, especially the canine teeth.

℞ Cocaine Hydrochlorate.................................2 grains.
Syr. Simp...$2\frac{1}{2}$ drachms.
Tinct. Saffron...10 drops.

M. Sig.: Rub the painful parts of the gums many times a day.—*Med. Brief.*

FILING GLASS.

The *Pharmaceutische Centralhalle* states that glass may be filed easily and without danger of breaking by dipping the file into strong soda lye and then, while still wet, into coarse sand.

HEMORRHAGE.

The hemorrhagic tendency may be controlled, very frequently, by hypodermic injections of ergotine dissolved in thirty times its weight of a mixture of pure glycerine and water in equal parts.—*Med. Brief.*

ANTIPYRIN

We have used with happy results in headache. It leaves no bad after-effect. Patients will often get out of the operating-chair with severe headache, which is relieved quickly by a 4 to 6 grain dose. The drug is one of the numerous productions from coal tar, the possibilities of which seem limitless. Before long we will have quinine or its equivalent from the same source.—*Southern Dental Journal.*

FRECKLES.

The physician is frequently asked by lady patients for something that will remove "moth" and freckles. A writer in *Pharm. Zeit.* says that a wash, consisting of equal parts of lactic acid and glycerine, will do the work, and is harmless when applied to the skin.—*Jacobi, in Archives of Pediatrics.*

REMOVING INDELIBLE INK.

Physicians are often asked how to remove indelible ink, and they sometimes cannot quite remember; so we repeat the following method: First moisten the stain with tincture of iodine, and after a few minutes, remove the iodine stain with solution of hyposulphite of soda. Finally wash in clean water. Repeat if necessary.—*Exchange.*

HÆMORRHAGE AFTER THE EXTRACTION OF A TOOTH.

Sir John Tomes writing on this subject says:—Matico rarely, if ever, fails to arrest the bleeding, if used with care in the following manner: Take the dry leaf and soften it in the steam of a kettle. Then roll it up, the underside outward, into a firm plug, the size of the socket from which the blood issues; clear out the coagulum perfectly, and introduce the so made, well fitting, matico plug. Place over the same a pledget of lint of sufficient thickness to enable the opposing teeth to press the lint upon the exposed end of the plug, and direct the patient to keep the mouth shut for several hours.

THE BEST ANÆSTHETIC.

There is undoubtedly at present a tendency, perhaps due to German influence, to return to chloroform as an anæsthetic. Mr. George Foy,

in defending chloroform anæsthesia in the *Lancet*, quotes the following statistics: "At the Edinburgh Infirmary, during a period of twenty-eight years from the introduction of chloroform into the surgical practice, only two deaths had been attributed to chloroform, which, according to Kerr, is one death in 36,500 administrations. Elser, of Strasburg, had used chloroform 16,000 times, and had never seen a fatal case; Kidd, of London, 10,000 times, without a death; Dr. Bardelebin, of Berlin, 30,000 times before meeting with a death; French surgeons in the Crimea, 30,000 cases, and not one fatal issue; English surgeons in the Crimea, 12,000 times, with one single death reported attributed to it; McGuire, of Jackson's Corps, 28,000 times, and no death; Richardson had seen it used in the London hospitals 15,000 times before he met with the first fatal case; Billroth, of Vienna, 12,500 times before he met with his first accident"

A NEW FORM OF PORCELAIN CROWN WITH GOLD COLLAR ATTACHMENT.

Dr. Frank Chasemore says: I have devised a method, and the following is the mode of construction: The root having been prepared in the usual way for all-gold crowns, an impression and bite are taken and a zinc die cast. To this the band is fitted, and the joint soldered half-way up. A suitable tooth is selected from stock and backed with a plate bent to the curve of the underside; the pins are turned over against the backing to fix it securely and the plate trimmed to the contour of the tooth. The band is now fitted to the cast and the upper edge filed away to fit the edge of the backing of the tooth, the edges of the unsoldered part of the joint being cut away, if necessary, to allow of the band being brought to the required size. When the occlusion is perfect, the tooth is fixed to the band with wax and the whole removed from the cast. The crown is now turned mouth upwards and a little wax melted into the interior to fix the parts together, so that the first wax can be removed, and the crown invested in plaster and sand, mouth upwards, and the joints soldered *inside*. When the band is finished and polished, the crown can be cemented to the root in exactly the same manner as a gold crown.—*Dental Record.*

TAKING LOWER IMPRESSIONS.

Dr. F. C. Green gives his method as follows: I use a very narrow impression cup, one not much wider than the alveolar ridge; fill the cup with plaster, very soft, adding a little sulphate of potash to make it set rapidly. When hard, remove from the mouth, and with a small

scraper, remove a thin layer over the entire surface of the impression; trim the edges, and especially the portion under the tongue. Place the impression in water for a few moments and when thoroughly wet fill it with very thin plaster, not thicker than cream; place it in position in the mouth with gentle pressure; observe that the buccanator muscle be not impinged upon, and request the patient to rise the tongue, letting the point rest upon the cup. When hard, remove, and if each step of the process has been carefully taken, the result will be an impression from which a plate can be constructed that will not rise or rattle while speaking. I never use anything but plaster for taking impressions of the mouth, believing it to be the only reliable material for this purpose.—*Archives.*

OXYPHOSPHATE OF ZINC.

Dr. E. S. Gaylord says: After the cavity is prepared and thoroughly dried, with a small piece of bibulous paper, slightly moistened with the cement fluid, paint the entire surface of the cavity, just to moisten (do not flood it), then proceed to insert filling in the usual manner. Filling to be removed, must be cut out with bur or drill, as it adheres perfectly. In cementing crowns, etch the surface of the gold, or other metal, with an ordinary excavator, bur, or any sharp instrument, and proceed as above, with a similar satisfactory result. —*Archives.*

SACCHARINE PROHIBITED IN FRANCE.

The following is an abstract of the preamble of the bill now before the French chamber prohibiting the importation of saccharine into France: "The attention of the administration has been directed to a new coal tar product known as saccharine. This substance, which differs essentially in its elementary composition from vegetal sugars, possesses much greater sweetening power, a quality that was sure to lead to its being used as a substitute for sugar in many cases. We learned from our consular agencies abroad that factories were being established in certain countries for the purpose of bringing saccharine into competition with beet and cane sugar, not only in France, but also in other neighboring markets. The high cost of that substance seemed to constitute an insuperable obstacle to its general adoption, but lately the situation has changed. It can now be more cheaply produced, and already it is extensively used, mixed with glucose, in the preparation of jams, sirups, and liqueurs. It has, therefore, become an urgent necessity to provide a remedy for the evil, in the interests of the customs receipts and that of the health of the consu-

mer: for it has been shown by the report of Drs. Brouardel, Pouchet, and Ogier, in the name of the consulting committee of hygiene, that saccharine, and the various preparations derived from it, are noxious to health, and ought to be prohibited. Wherefore the government has deemed it expedient to prohibit the importation of saccharine and saccharined substances"

EASY EXPERIMENT IN CHEMISTRY.

The *Practical Teacher* gives the following simple experiment in chemistry, which any child can try:

Cut three leaves of red cabbage into small pieces, and, after placing them in a basin, pour a pint of boiling water over them, letting them stand an hour: then pour off the liquid into a decanter. It will be of a fine blue color Then take four wineglasses—into one put six drops of strong vinegar: into another, six drops of solution of soda; into a third, the same quantity of a strong solution of alum: and let the fourth glass remain empty. Fill up the glasses from the decanter, and the liquid poured into the glass containing the acid will quickly change to a beautiful red: that poured with the soda will be a fine green: that poured in with the alum will turn to a pretty purple: while that poured into the empty plass will remain unchanged.

TO PRECIPITATE GOLD.

The gold from galvanic baths is easiest precipitated with the galvanic current upon a smooth copper plate. The gold which does not precipitate as a powder is then scraped off and purified, as well as that which precipitated as powder. Impure gold, which chiefly consists of gold, however, is dissolved in the indicated proportions in the *aqua regia:* it is then evaporated to one-half, diluted with water, filtered, and washed out with large quantities of water. This washing is continued until the escaping fluid is clear water, and no longer colored by sulphate of iron. Meanwhile a solution of handsome crystallized sulphate of iron has been prepared as follows: To 10 grammes (6 dwts. 10·32 grains) sulphate of iron, 100 grammes (3 oz. 4 dwts. 7·2 grains) water add 10 grammes muriatic acid. For precipitating the gold suffices the 4½-fold quantity of crystallized green copperas of the impure gold used. In order to precipitate the gold, pour its solution into the copperas solution. The gold will very quickly fall down in this diluted fluid. Decant the clear liquid, and first wash with water acidulated with muriatic acid, afterward simply pure water. Collect the gold in a porcelain dish, drain off the wash water as closely as possible, and let it dry in a moderately warm place.—*National Jewellers' Journal.*

OPENING INTO PULPS.

In opening into pulps, my first act is to sterilize the cavity with 1-5 of 1 per cent. sol. bichloride of mercury, and then take every care not to force any of the contents of the pulp chamber through the apical foramen. I invariably dip my barbed points in the bichloride solution, as also all the instruments used in removing dead pulps. I use the same precaution in the treatment of exposed pulps. I believe that fully one-half of the cases of failure after exposure are due to infection at the time of exposure, if the case be one of instrumentation. The moment I expose a pulp I touch it with bichloride solution, and afterwards seal it up with ether and rosin as a protective coating.—*Dr. G. S. Allan, in Ind. Practitioner.*

DANGERS FROM THE USE OF COCAINE.

1. Certain persons possess an idiosyncrasy to cocaine which cannot be foreseen or entirely guarded against.

2. Cocaine exerts its toxic effects upon the nervous centres and, secondarily, the heart.

3. Its evil effects are most liable to be seen in neurotic subjects.

4. The danger in cocaine poisoning is mainly from paralysis of the heart, syncope.

5. It may be well to precede its use by the administration of alcohol or other cardiac stimulant, as is done with chloroform.

6. Special care is needed in "weak heart" and organic heart disease.

7. The subcutaneous administration is dangerous, and should be avoided.

8. The use of the stronger solutions is dangerous and unnecessary.

9. The treatment of cocaine poisoning consists of measures to rouse the heart, especially the inhalations of nitrite of amyl.—*College and Clinical Record.*

TO RESTORE THE POLISH OF INSTRUMENTS.

Dr. Frank L. James, editor of the *St. Louis Medical and Surgical Journal*, gives in the August number the following useful information regarding the restoration of polish to surgical instruments:

Some weeks ago, the stopper of a bottle of corrosive sublimate, which was carried in a satchel along with a lot of loose instruments, came out, and the chemical was emptied into the bag. The fact was noticed at the time, and the next day the instruments were found covered with rust and in some instances quite badly eroded. How to get the instruments clean without sending them to an instrument-

maker, was a question I determined to settle by experiment. The instruments consisted of dressing forceps, scissors, needle-holder, needles, several bistouries, scalpels, etc., the knives all having tortoise-shell or ivory handles. Without going into the details of the experiments, I will give you the method of procedure which yielded perfectly satisfactory results. A saturated solution of chloride of tin in distilled water was made, and with this a large number of test-tubes were filled to a height sufficient to admit of the immersion of the blades of the knives the forceps, etc The instruments were inserted and left over night. The next morning they were found quite clean, and of a matsilver whiteness. Rinsing in running water, wiping and rubbing with a chamois completed the operation. Chloride of zinc solution gave pretty good, but not nearly so satisfactory results.

ECONOMY IN THE DENTAL OFFICE.

I wish to state at the beginning, that some of the matter and things suggested now are not for those who are amply able to buy, but for those who wish to avail themselves of a few hints and receipts found by one who has proved their usefulness and staying qualities, at a small expense of money, and not much more of time.

Firstly, then, Soap.—Save all small pieces of soap that accumulate about the office from the operating room and laboratory, cut into small pieces with a knife place in a tin vessel, add a little water, pumice stone (powdered) and a very small amount of concentrated lye, boil over a slow fire until all is nearly dissolved or melted, pour out into a vessel for moulding, and when cold cut the desired size, and you will have the most desirable laboratory soap anyone could wish; it will remove all stains, and with a five cent package of soapine you will have soap for the laboratory sufficient to last a year.

It seems to me sometimes that some of the materials we buy from the dental depots were made by men who were never inside a dental office, much less have done any work, and especially is this true in regard to sheet wax for base plates; the wax the dental depots have for sale is like some people's pie crust, entirely too short. I like long pie crust, ditto wax.

Save all the scraps of wax and modeling composition, put into a tin vessel four inches in diameter and ten inches high, with a handle like an ordinary tin cup, it is really a tin cup with about three additions; in other words, a three story tin cup; into this place your material for making your sheet wax (your scraps of wax and modeling composition) and, if you have never made wax in this way in all probability you will have to add a pound or two of ordinary beeswax,

for your vessel must be made full. Now pour water into the vessel sufficient to keep it from burning, say one half pint; when all is melted, lift off the fire, and have two pieces of glass just wide enough to go into the vessel containing the melted wax, and long enough to reach above the top to afford space to grasp it, near by a pail of water with a piece of ice in it; place the glass into the water until cold, now take the glass out of the water and put into the melted wax, lift out immediately, scrape the edges with spatula, plunge into cold water, and two very nice sheets of wax, just the thickness and toughness desired will fall off, and nicer sheet wax you never used, and in one short half rainy day you can make sufficient wax to last you a year.

CONTINUOUS GUM WORK.

DR. W. H. MILLER, CANTON, OHIO.

How to wake a continuous gum artificial denture and adapt it to rubber or metal plates successfully, so that it can be produced at a low price, is a problem that has long been before the profession for a solution.

I have adopted and am using a method that meets the requirements, from an artistic and financial standpoint.

From the model, make a die and counter-die of the anterior part of the mouth, as far back as the bicuspids. Strike up a piece of platina, which will now fit on the model. Set up continuous gum teeth, back, solder, apply body and enamel in the usual way, and fuse. You now have a complete block of the eight anterior teeth that have been arranged to meet the requirements of the case in hand, which are all the artist has made them. The gum portion exactly conforms to the model, and is all they have been designed to be to fill the special demands that each case calls for. There have been no "joints" to grind, nor "dark joints" to fear, and the block as a whole is strong. The block is now placed on the model in the articulator, the remaining teeth set up, the case waxed up, vulcanized and finished. You now have a denture, beautiful and cheap. It has cost but little more for material, and requires but little more labor than the most ordinary denture, though, as a finished product, the result is as much better than a set of sectional blocks as the difference between a fine, artistic painting of a subject by the hand of a master, and the same subject from the hand of a mere mechanical dauber of colors.

By practicing this method you have within yourself the ability to produce the best possible results, not being in the least dependent on the accident of having something in stock "that will do," but with which neither you nor your patient should be satisfied.

Any case can be taken charge of, with the assurance that what should be done can be done, without distrust in the result and dissatisfaction in the patient. There is the comfortable satisfaction of knowing that the best has been done, and of its acknowledgment by the patient. Besides the price can profitably be made so low as to compete with the ordinary "store teeth."

SOUTHERN DENTAL JOURNAL.

B. H. Catching, D. D. S., Editor, Atlanta, Ga. Julian J. Chisholm, M. D., on "Anæsthetics."

The successful administration of an anæesthetic does not consist merely in holding before the nose of the patient a cloth with the narcotizing agent poured upon it. Skill, care, prudence, judgment, and courage in time of need, are all needed to guard the narcotized patient from danger. Too little of the anæsthetic—not enough to protect the important vital centers from the influence of painful reflex actions—is as dangerous as an overdose of the narcotic inhalant. Many of the fatal accidents occur in the hands of timid physicians or dentists who are afraid to administer enough of the anæsthetic to secure the stage of safety, the immunity from reflex disturbances, and who loose their heads in fright when the danger which their want of confidence has induced presents itself.

The lesson which I would impress upon every one who uses chloroform, sulphuric either, or the bromide of ethyl for general anæsthetic purposes is that prompt suspension, with head down, is the remedy for suspended animation suddenly coming on during acquired narcosis.

No surgeon recognizing the responsibility of his work should ever give an anæsthetic without having some one present. Should there be any sudden and alarming weakening of the heart's action and of respiration—for they always go together—without a minute's delay hang up the patient. Should the patient be bulky, and should there not be force enough present to elevate the foot of the table or bed, be the patient man or woman, while you stoop throw their legs over your shoulders, hang on to their feet in front of you, and then lift yourself. The patient's body, as you get on your own feet, will hang from your back, with the head down. Now you have time to call for more help, if you need it. Never wait for the help to come before you practice suspension, because with the moment's delay your patient may have passed from dying into death, from which there will be no more earthly awakening. When too long delayed—and one minute is a fatal loss of time—suspension is as useless as the other recommended remedies and can then do no good.

Should the case have been one of needless fright, with only weakening, and not suspension, of the vital functions, no harm has been done. The feeble pulse will always respond promptly to the suspension. It is my constant practice to use suspension for restoring strength to the heart's action after the administration of chloroform, where there is cardiac depression and weak breathing. I use this means of restoring vigor where others use the more objectionable and less efficient hypodermics of whisky or ether, or the inhalations of nitrate of amyl. It is very instructive to observe how promptly the pallor leaves the face, and how strong the pulse will become, as the blood gravitates toward the head. Should vomiting occur when the head is hanging down, this suspended position is better for the patient than when lying upon the table, because there is no fear of food-particles getting into the larynx. Inversion of the body gives the contents of the stomach free vent.

Such confidence do I feel in the value of suspension with chloroformed subjects that I am sometimes disposed to believe that the vital centers cannot fail with the head hanging down.

HYDRONAPTHOL.

After a daily use of the above named antiseptic and disinfectant for more than two years, I write the following :

Hydronapthol is non-poisonous, non-irritant, non-corrosive and odorless ; and is preeminent as a dental antiseptic and disinfectant. It is twelve times as effective as carbolic acid, and has none of its disagreeable properties. When the corrosive and poisonous properties of mercurious bichloride are taken into consideration, the hydronapthol solution is far preferable, and for practical purposes it will supercede all other antiseptics in the practice of dental surgery.

As an antiseptic wash for the mouth, the antral cavity, or for cleansing instruments, use a saturated solution, viz.: seven grains to a pint of boiling water. Use it freely ; the drug is cheap and a little of it goes a long way. For treating ulcerated teeth and foul pulp-cavities, ten per cent. solution in either alcohol or glycerine. Use it freely. In case of "blind abscesses," I dry the pulp-chamber with absorbant cotton, flood cavity with the ten per cent. alcoholic solution, remove debris and prutrescent pulp, wash out with peroxide of hydrogen, and fill roots with cotton saturated with hydronapthol solution. Seal tightly and let remain two or three days. If at the end of that time there is any odor, repeat treatment. The hydronapthol being odorless is a great advantage, as you can readily see.

Try it and you will banish carbolic acid and mercurious bichloride

from the office. It is manufactured by Seabury & Johnson. Don't use beta napthol; it is not synonomous with hydronapthol, and is a poison. Send to its manufacturers and get a pamphlet that will give you reliable information regarding its uses.—*Archives.*

T. C. McCoy, California.

"THE REDUCED VULCANIZING TIME."

By A. H. Hilzim, D. D. S., Jackson, Miss.

In reply to Dr. John G. Harper's query, in the May number of the *Archives*, would say that the Vulcanizer used is the "Whitney," with ordinary mercury bath thermometer. The *entire time* required for vulcanizing, from the moment of lighting the gasoline to the moment of turning it out, is fifty minutes; that is 20 minutes to get the heat up to 300°, and 30 minutes for the vulcanizing. I have continued to use this time in my practice since writing the article on the subject. The rubbers tested, as before stated, were Johnson & Lund's extra tough, Ash & Son's pink, and Doherty's weighted. White's Dental Gum was also perfectly vulcanized in the same length of time. My experience has been, that the rubber has come out much tougher than with the former vulcanizing time, which I think cooked it too much, and rendered it brittle, especially in the case of the pink and weighted rubber. The fact that such an utter failure was made with the "Atlas" rubber when tried with the same time and heat, proves that this treatment does not suit all makes of rubber, and *also proves* that there is *nothing wrong* with my thermometer.—*Archives.*

WHY DOES DESICATING A CAVITY MODIFY SENSIBILITY?—ADVANTAGES OF THE PRACTICE.

By Chas. Harker, M. D., D. D. S., Mt. Holly.

Every practitioner knows that drying a cavity modifies, very considerably, the sensibility, thus enabling the operator to excavate with little or no pain to the patient. Why this modification results from simply drying the cavity may not be so plain to every one, and, although satisfactory explanations may have been given, I have never heard one given or met with any in my professional reading.

To my mind, the explanation which best satisfies the inquiry, is as follows: Living dentine is made up of tubuli, filled with a nutritive fluid; in cutting or burring, force is applied upon the ends of these little capillary tubes, and upon the columns of fluid which they contain; this is communicated through the fluid to the pulp and is thus applied hydrostatically to it; pain results. Desicate the cavity and you

are no longer applying force to the ends of these fluid columns by contact of the instrument; the fluid having been evaporated, the columns no longer exist: at least there is no fluid in the ends of the tubes upon which force is applied in cutting, hence no force is transmitted to the pulp, and no disturbance of nerve tissue results.

I am aware that nerve fibrillæ are said to ramify throughout the dentine, but, granting this, in my opinion, it is not the cutting of these that causes the major part of the pain, though it may, before desicating them, in a minor degree. After desicating, the instrument comes in contact with little else than inanimate lime salts, in which there is no sensibility. I might mention, as corroborative of my theory, the fact that before desication, a dull instrument will cause more pain than a sharp one, because more impact is made upon the columns with a blunt tool than with a sharp one. Again, to illustrate that impact upon a column of fluid will cause pain in a sensitive part beyond, take a dead root, having an inflamed peridental membrane, the root canal being filled with fluid, pass an instrument up the canal and the instant it comes in contant with the end of the column of fluid, there is pain in the part beyond. But gently absorb, and dry with warm, dry air this same canal, and the instrument may be entered and passed up the canal without pain, there being no hydrostatic force transmitted to the sensitive part. In this experiment we have an illustration on a large scale of what takes place in cutting dentine with and without fluid contents.

There are several methods of drying cavities; warm, dry air thrown gently into the cavity, after the application of the dam, being the best. Now, a word as to the advantages of drying sensitive cavities before excavating: The advantages are two fold—first, to the patient, by diminishing pain and dread of dental operations; and secondly, by increased number of patients for the humane operator. To the young operator, who has a super-abundance of time and a scarcity of patients, I would strongly recommend the practice of desicating all sensitive cavities. It is the surest, safest, best and cheapest method of obtunding sensitive dentine. I have used cocaine (as high as twenty per cent. solution) without effect, after which I applied warm dry air to the same cavity for a few minutes, and was then able to excavate without pain. I say I commend the practice to young operators especially, because I know it has brought me (a young practitioner) scores of patients from the old practitioners about me.

The hope that I may help those most in need of help, has inspired me to write for publication in the *Archives* this much of my thought and experience.

THE WORKING OF CELLULOID.

The chief cause of failures, when moulding celluloid by either steam, oil or dry heat, is owing to the form of the blanks, which could be easily remedied by changing the moulds, which necessitates from a half to an hour's hard work of scraping and filing, with the result then of only a faint approximation of what a blank should be.

That the color of the celluloid blanks could be made to resemble every shade of mucous membrane, no one can doubt who is at all familiar with the innumerable articles of every conceivable shade now on the market.

The tendency of culluloid to warp and discolor can be overcome by moulding it in a plaster investment heated to a temperature of 315 in a dry chamber.

The moulding at this high degree of heat must be done inside of five minutes, or the celluloid will become porous or burn.

The judgment now necessary to mould a celluloid plate in five minutes, and have the denture come out perfectly finished, all ready to be placed in a patient's mouth, without any filing or polishing, requires mechanical skill of a high order trained by long experience.

It seems to me that the following method will enable any mechanical dentist to make a perfect celluloid denture every time without a failure:

Set the teeth up in paraffine in the usual manner, trim and shape the paraffine to the exact form you wish the celluloid plate to have, run a small bead of paraffine around the pins, dip the case in cold water and remove the teeth with the thumb and finger; partially fill the cavities left by the teeth with melted paraffine, invest this paraffine pattern on a tin die in plaster, the same as you would if the teeth were in place.

Scrape and file a celluloid blank, especially in the roof, until it is as near the form of the paraffine pattern as possible. Heat the plaster investment, and mould at about 270°. Get the plaster all off the celluloid, even if you have to polish it. You will then have a *perfect blank*, which can be easily moulded into the teeth in five minutes, without danger of crushing the teeth or cracking the investment. This process saves time and teeth, and there is a greater demand for these perfect celluloid plates at $30 each, than for rubber plates at $10 each, by the same class of people.

In the six years that I have made celluloid plates by the dry heat process, I have never seen a broken one. The teeth break the same as on other bases.

To replace a broken tooth: Select a tooth, cover the pin with an

excess of paraffine, place it paraffine up in the lower half of a flask filled with plaster; fill the upper half of the flask with plaster, open the flask and remove the paraffine; heat the investment and melt a piece of celluloid on the tooth the same as if you were moulding a whole denture.

Enlarge the cavity, left by the broken tooth, on the lingual side. After grinding the teeth and shaping the celluloid until it fits perfectly, cement it in place with collodion. The union of the celluloid will be perfect, and the tooth will be held as firmly in place as any tooth in the plate. The difficulties encountered in trying to overcome these two points have confined the manufacture of celluloid dentures to a very few dentists.—*Seabury, Independent Practitioner.*

IMPLANTATION OF METALLIC CAPSULES.

At a recent meeting of the Student's Society of the New York College of Dentistry, Dr. J. W. Edwards read a paper on the above subject, of which the following is an abstract:

In March, 1886, the idea first occurred to me of implanting metallic roots. Since that date I have carefully considered the possibilities and probabilities of such an operation. After examining many specimens of encysted metallic bodies, such as silver ligatures and lead bullets, I concluded that lead would be the most suitable of metals to become encysted. First, because of its peculiar antiseptic properties; secondly, it is softer and more pliable than any other metal, and, therefore, more easily adapted to the walls of the alveolus; thirdly, after oxidation inflammation begins to subside.

Concluding that the operation would be successful, I determined to operate at the first opportunity. A favorable case presented itself October 21st. The patient, a young lady of twenty, had the root of a first right superior bicuspid extracted and replaced by a metallic capsule.

My method is as follows: Where the natural roots are extracted, a platinum capsule is made to correspond. The capsule is first dipped in hydro-chloric acid, then in melted lead, and then serrated with a wheel burr. Before inserting, thoroughly syringe the socket with a five per cent. solution of carbolic acid, or, if there has been an abscess, a solution of bichloride of mercury. The socket is then cocainized with saturated cotton.

The capsule is now inserted and burnished perfectly to the walls of the alveolus. The patient should be seen daily until all inflammation has subsided. Should any undue inflammation occur, local treatment should be carefully followed out. I consider the local application of

ice most efficient. After the capsule is firmly encysted, the crown may be inserted—time, three or four weeks; allowing this time for rest before inserting the crown, is carrying out one of the first principles of surgery.

Implanting metallic capsules where teeth had been previously extracted, I first inject cocaine. I then use spiral knives, Nos. 1 and 2, devised by Drs. Walker and Tounger, and reamers Nos. 2 and 3, Trephines Nos. 4 and 5; also tubuler knife No. 3.

After the socket has been formed and thoroughly syringed, as before directed, an impression of the socket is taken with modeling composition. A piece of soft wood is made small at one end, forming a shoulder about one-half an inch from the end. The small end must be smaller than the socket which is to enter. The modeling composition is made soft and placed around the small end of the wood, and pressed into the socket. In this manner an accurate impression of the socket may be obtained.

This impression serves as a model, and is moulded in sand in the usual manner.

A zinc cast is then made, the platinum foil is made to fit this cast and soldered with silver, dipped in hydrochloric acid and then in melted lead, following the directions previously given.

I believe any number of metallic capsules may be thus implanted, without injury, as the basis for a full upper or lower denture, or both. My idea is to implant four metallic capsules, two in the posterior part of the arch—one on either side—two in the anterior about the location of the canine teeth. The denture must be constructed as follows: A rim of gold twenty-two karets fine, twenty-eight standard gauge in thickness, may be swaged to fit the gum, and four abutments soldered to it to correspond with the implanted capsules, and to telescope in the same. Counter sunk teeth may be attached to the gold rim with a pink rubber, or the rim may be made entirely of platinum, and continuous gum teeth may be attached.

EDITORIAL.

The International Dental Journal.

Our worthy contemporary appears with the new year in its new title. We hail it with words of good cheer, and wish it as successful a career in the future as its progenitor the "Independent Practitioner" had in the past. The profession needs such a journal, and the want is well supplied by this publication. We might speak at length of its many valuable features, but space forbids—we must allude, however, to its very thorough *topical index*, as one of its most valuable

features, which gives evidence of the most thorough reading of the articles which have appeared in its pages, as well as the great labor and painstaking which such a compilation must have entailed.

We had intended this notice for our March number, but it was crowded out by other matter. ED.

TRANSACTIONS OF THE INDIANA STATE DENTAL ASSOCIATION.

A most excellent paper on Prosthetic Dentistry, was read by its author Dr. L. W. Comstock, at a meeting of this association which we earnestly recommend to the perusal of every member of the profession.

We regret that its length, with its profuse illustrations, so ably selected, precludes its reproduction in our journal, as we hold, with the poet, that "a good tale is none the worse for being twice told." The author makes some fine points in his remarks about the artist who paints a picture, and the dentist who puts in a set of teeth. We have all seen the incongruities where the wood-be artist was not an artist, and the prosthetic dentist had no artistic conception. Witness the frequent incongruity, where a boat with her flags flying indicate the wind in one direction, while the smoke that issues from the chimney of the cottage, not far off, shows it in the opposite. In like manner we will see a set of the narrowest teeth in the mouth of a broad faced good natured German, while an illnatured, cross grained impecunious, narrow minded "cuss" will be provided with teeth as broad as those of a horse. It will only be when men will *think* and *study* and *observe* and *reflect* that these inconsistencies will become fewer.

ED.

BOOK NOTICES.

Contributions to the History of the Development of the Teeth—by Carl Heitzmann, M. D., and C. F. W. Bödecker, D. D. S., M. D. S.—The above work appears in pamphlet form, making it more valuable for reference than it otherwise would be, if the subject were looked up in the pages of the "Independent Practitioner" from which these valuable papers are reprinted. These papers comprise a most thorough dijest on the subject of the development of the teeth from the most advanced opinions of the day. ED.

A Text-Book of Operative Dentistry—by Thomas Fillebrown, M. D., D. M. D., professor of Operative Dentistry in the Dental School, of

Harvard University; member of the American Dental Association, American Academy of Dental Science, etc. Written by invitation of the National Association of Dental Faculties. Three hundred and thirty illustrations. Philadelphia: P. Blackiston, Son & Co., 1012 Walnut Street, 1889.

The above work is one of the most valuable treatises on the subject of Operative Dentistry that has appeared for some time past. It contains so many valuable suggestions, and so concisely given, that it is difficult to discriminate in pointing out its valuable features. We wish we had space to give it the notice we would like, for its many good points; and the succinct manner in which they are given. The work will be alike valuable to *Student* and *Practitioner*.

ED.

Transactions of the American Dental Association at Twenty Eighth Annual Session, held at Louisville, Ky., in joint session with the *Southern Dental Association*. Philadelphia. The S. S. White Dental Manufacturing Co., 1889.

This work appears in the most creditable form, and contains a very minute and correct report of the joint sessions of the two most prominent national societies. The typography is clear, bold and excellent, and many of the papers nicely illustrated. Apart from its general get up, it contains much valuable information not to be found in the current literature of the day. ED.

STUDENTS' SOCIETY.

NEW YORK COLLEGE OF DENTISTRY, 245 EAST 23RD ST.

The election of officers for the Students' Society, was held at the college on Monday, Feby. 4th.

The following were elected officers for the season of 89-90:

President, C. G. Pease; 1st Vice President, D. W. Byrne; 2nd Vice President, G. W. Ham; Secretary, S. P. Russell; Assistant Secretary, C. H. Emerson; Librarian, H. C. Crosscup; Treasurer, C. C. Richardson;

L. S. Rosenstiel, Jr., Asst. Secretary.

The first "Annual Meeting was held on Monday, Feby. 18." in the lecture room at 8 p. m.

Professor Abbott awarded the prize, and the officers for the season were installed.

E. H. BABCOCK,
President.

ELECTRICITY AND SULPHUR IN DENTISTRY.

(A COMMUNICATION TO FIRST DISTRICT DENTAL SOCIETY, NEW YORK.)

The subject-matter that I wish to present to you to-night is not the record of a finished experience or of a series of valuable experiments, but simply the narration of a few hints which I have been fortunate enough to discover and which I wish to give to you, so that each in his own way may test the matter. For I am convinced that these hints contain germs of truth which in abler hands than mine can be made of value to the profession.

For years I have known in a general way that burning sulphur was valuable as a destroyer of vermin and also of disease-germs, but it was only within the present year that the thought came to me that perhaps it might be equally potent for use in canals containing putrescent pulps. The thought was at once followed by action, and the experiment was so entirely successful that since that time it has been used in each and every such case occurring in my practice during the past ten months. In the beginning I used a medium-sized probe, which was heated in a flame and dipped in sulphur, and while it was fuming carried to the desired spot. But I soon found that this caused a blackening of the surface of the cavity which was sometimes hard to remove. I then joined a piece of platinum to my probe with better results, but for a considerable time I have used the electric cautery, the platinum-wire loop being small and twisted so as to get sufficient stiffness in a wire small enough to enter the pulp-canal. The results of this treatment are briefly these. It very materially shortens the time necessary to restore inflamed and abscessed roots to health, there is generally an almost immediate cessation of pain, it does away with all other medicaments or disinfectants, and makes out of a troublesome and often unsuccessful operation one that is generally successful and comparatively easy—so much so, that out of a large number of devitalized teeth whose roots I have opened, cleaned and filled, I have not had to extract more than five per cent. Such results I have not been able to attain by any other mode of treatment. In order that you may better understand this matter, let us take the superior central incisors and by them illustrate several different operations in which the sulphur is eminently useful. The left incisor we will suppose has a large, shallow saucer-shaped approximal cavity extending nearly the full length of the tooth, the wall merely plates of enamel, the pulp almost exposed, the dentine hypersensitive, the patient ditto. The cavity as presented has absolutely no under-cuts and no room to make any that will be adequate; and even if we dare drill, hoping to

get something from nothing, the patient at once and most emphatically rebels.

I think that here we have the typical hard case, the multiplication of which has put gray hairs on many an honest head. In a large majority of similar cases our sulphur will help us. Before applying the rubber dam, fumigating the gums with sulphur will frequently render them less sensitive to the cutting of the cord. Then before commencing to bur the cavity we will flood it with the fumes and will generally find a goodly measure of obtunding. It is quickly done, its effect is immediate and as lasting as anything that I know of; it does not materially hurt the patient, and can be applied as often as necessary. After we have cut as much as we dare and are still almost if not quite hopeless of any good result, we will make ready some cohesive cylinders or a mat of William's crystalloid gold, also whatever is our favorite in the way of cohesive gold, with which to form the filling. Then we will take the platinum loop and give it the proper heat to just melt the sulphur but not to burn it, and with this smear the floor of the cavity; then while it is yet soft heat the cylinders and place them on end in the cement, then while everything is still warm and before the cement has become brittle place on the cylinders and press into cohesive contact the masses of gold chosen to form the bulk of the filling. From this point complete and finish as usual.

We will find that we have secured a good degree of adhesion to the cavity, which, taken with the moderate under-cuts, will give us a fairly substantial filling.

Now we turn our attention to the adjoining central, and we find that it is so badly broken that nothing remains but to supply its place with an artificial crown. The canal is filled with a putrid pulp of the excessively malodorous kind, and of course there is an abscess with its accompanying inflammation and pain. The patient, unwilling to be hurt, begs for extraction as the least of two evils; but with a consciousness of being master of the situation, and with a prayer of thankfulness that we are thus master, we speak a word of comfort to the patient and reach for our lightning. With the platnium loop dipped in sulphur the canal is fumigated and with suitable drills opened a short distance, then with medium and small "Morey" drills we slowly advance towards the apex, alternately fumigating and drilling till we reach a point so near the apex, than there can be but an infinitesimal portion of septic matter left, and that will be so saturated with the sulphur as to be practically inert. All this time we have avoided with the utmost care going through the foramen, so as not to force any particle of septic matter into the inflamed tract surrounding the root.

and which has already as much trouble on its hands as it can well care for. Neither will we put medicament of any kind in the canal expecting them to go through the foramen. We have removed the cause, and we may well leave to nature the task of curing the effect, provided we do not complicate matters by forcing into that diseased tract hot irritating foreign substances, such a carbolic acid and the like, which if put on a healthy place would cause rebellion most emphatic. At this point you can elect whether you will practice immediate root-filling, or do what will perhaps oftentimes be better, close the canal and dismiss the patient for a few days to allow the excitement in the associate parts to subside. If the case should prove stubborn, the sulphur treatment can be repeated as often as necessary. After shaping the end of the root as usual, we are ready to prepare the canal for the crowning process. In cleaning the canal we were careful not to enlarge it more than just enough to remove the septic surface, and we have left its natural taper as nearly intact as possible. We will now take an "Ottolengui" reamer of the smallest size that will fill the canal, and ream it out to the point reached by the drill; this will give us a tapering hole of a moderate size with a good amount of solid root on all sides. In this we will fit a platinum and iridium pin of the same taper, getting as exact a fit as possible.

Placing this firmly in the canal, taking care however not to fasten it there by too much pressure, we mark the exact spot where it emerges from the root. We will now take an old-fashioned wood pivot tooth and fit it to the end of the root. Then being guided by the mark on the pin, we will cut the pin to such length as will allow the crown to sit firmly on the root. The pin must now be shortened at the crown end just a trifle, so that when placed in position it will not quite fill the tapering hole in the root and there will be a little space for the sulphur cement around the pin. Now heat so as to dry the crown and fill the hole with sulphur, then holding it in a pair of pliers melt the sulphur. Also have the pin hot and coated with melted sulphur, then place the pin in the hole in the crown in about the proper position and hold steady till cold. Now with the platinum loop dry and heat the canal as hot as is safe and pleasant. If the canal is not dry the cement will not adhere. With the loop at a low heat smear the inside of the canal and the end of the root, and while it is still warm take the crown this time in your fingers that you may not get too much heat, and heat the pin and thickly coat it with the melted sulphur; then place it in the root, pressing firmly, and at the same time getting the alignment, for the cement that holds the pin and crown together will have

softened sufficiently to allow of this. In a few moments all is cool and fast, and you have an operation easily, quickly, and comfortably performed, and one that will stand as long as many a one that has given a great deal more trouble to both patient and operator. If you wish to remove or change the position of the crown, take a small pair of straight forceps and heat the beaks quite hot, and grasp the crown, and in a few moments the cement is soft and you can do with your tooth as you please. There are other uses for the melted sulphur, such as fastening handles to instruments, uniting metals and glass, &c., all of which you can study out for yourselves.

In my remarks to-night I have spoken of my use of electricity only in its relations to sulphur. In reality that is but one of several uses to which I put it. In various ways it is my willing and ever-ready helper, and a source of much comfort to both my patients and myself.

I am well convinced that any dentist with a reasonably full practice would find it greatly to his advantage to have this help, and I feel confident that in a few years it will be as common as the dental engine is now.

TREATMENT OF THE PULP, AND ROOT-FILLING.

By E. H. Allen, D. D. S., Freeport, Ill.

He takes the case of an upper bicuspid, with a large cavity on either the anterior or posterior approximal surface: the cavities nearly reach the pulp, often there is a pulp exposure, the patient complains of this tooth being a little sensitive when drinking anything hot or cold; without aching. Having the dam applied, proceed to remove all soft decay with a spoon-shaped excavator. Having reached hard dentine, even though it be discolored and have not yet found any exposure of the pulp, wipe the cavity with carbolic acid, dry it, and place a covering of oxyphosphate cement over the nearest points of exposure, leaving room enough in the cavity to anchor a permanent filling, and fill at once. Most cases of capping exposed pulps are, he thinks, failures, resulting in pain and annoyance to the patient, and trouble to the dentist. Greater success, he thinks, lies in devitalising the exposed pulp and properly filling the roots, than by the conservative treatment. He prefers to reduce the congestion and inflammation of the pulp before applying the arsenic, as it sometimes causes severe pain; for this carbolic acid and iodoform are very efficient. A dentist should never apply arsenic without having the dam applied, unless it be impossible for him to do so, for should any of the arsenic get on any

part of the gum, trouble will ensue. Use the least possible quantity, placing it directly upon the exposed portion of the pulp. Then seal the cavity with Fowler's or Gilbert's temporary stopping; don't use cotton. Then dismiss the patient with instructions to return in 2 or 3 days. At that time the pulp is in the best possible condition for removal. No serious danger would arise if the arsenic should be left in the tooth for a week or more, but the pulp would be more tender, pull apart into little pieces, making the removal more tedious. When the patient returns, again apply the dam, take a sharp bur, about No. 4 or 5, and cut right into the pulp chamber, making a large opening and entirely removing the bulbous portion of the pulp in that way; then take a new small size, barbed broach, remove the remaining portion from the roots; try to entirely remove the pulp at this sitting. Now, if all this pulp is removed, the next thing to do is to check any bleeding, dry the root canals, wipe them with carbolic acid and fill them at once, for no better time can be had, don't wait for additional treatment. The crown may be filled at this sitting. About pulpless teeth and those which have commenced giving trouble, we know that prompt treatment the trouble can be averted by simply opening the pulp chamber freely, and applying a capsicum plaster or iodine and aconite to the gum of the affected tooth. If alveolar abscesses present the treatment best pursued is to assist nature by applying counter irritants to the gums. Sometimes the pus can be drained out through the roots, make an opening into the abscess by drilling through the process, not waiting for an opening to come of itself. Dismiss the patient, with instructions to return in a few days. By that time the flow of pus has stopped. Then the treating and filling of the roots is the next thing to do. Apply the dam, dry cavity and root canal, remove all debris possible with excavatore or such other instruments as suit best. Then wash root canal with alcohol, as this removes fats. Carefully wipe dry. Then pump peroxide of hydrogen into the root. Allow it time to thoroughly permeate the tooth, root canal and all. Then dry and apply bichloride of mercury (1 per 1000), in much the same manner that the peroxide of hydrogen was applied. Dry this out and lastly wipe the root with carbolic acid. He advises filling at once and using chloro-percha and gutta-percha cones root filling. Simply place a drop of the chloro-percha in the cavity with a smooth broach. Work the liquid into the roots. Capillary attraction will be found to help the chloro-percha into the roots. Then take a gutta-percha cone and push it into the root. This will probably fill a root as it can be done.

MISSISSIPPI DENTAL ASSOCIATION.

The Annual Meeting of the Mississippi Dental Association will be held at Vicksburg, Miss., commencing on Tuesday, May 21st, 1889.

E. E. SPINKS, Cor. Secretary,
Meridian, Miss.

NEBRASKA STATE DENTAL SOCIETY.

The Tenth Annual Meeting of the Nebraska State Dental Society will be held at Wahoo, on the third Tuesday in May, 1889, continuing three days.

From the present outlook this promises to be the best meeting in the history of the Society. Several men of prominence in the profession from abroad will be with us.

J. J. WILEY, Cor. Secretary,
Wahoo, Neb.

MASSACHUSETTS DENTAL SOCIETY.

The Semi-Annual Meeting of the Massachusetts Dental Society will be held at The Institute of Technology, Boston, Mass., June 5, 6 and 7, 1889. An invitation will be tendered all dental societies to send delegates and all members of dental societies are invited to attend. Representatives of the profession from Canada and the British Provinces are expected to be present.

CHICAGO COLLEGE OF DENTAL SURGERY.

The Seventh Annual Commencement of the Chicago College of Dental Surgery was held at the Grand Opera House, Tuesday, March 26, 1889. The Class Valedictory was delivered by Benjamin Franklin Eshleman, D. D. S., and the faculty address by Prof. Geo. H. Cushing, M. D., D. D. S.

The number of matriculates for the year was 154.
" " graduates " " " 64.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

The Examination at the Royal College of Dental Surgeons of Ontario was held in Toronto, March 5 to 8, inclusive, 1889. Excepting practical work, the examination is wholly written.

The number of Students in attendance for the session of 1888–89 was 52.

The following obtained the diploma, conferring the title of L. D.S., viz. :—

Name.	State or Country.	Name.	State or Country.
N. W. Cleary,	Renfrew.	C. S. McLean,	Brockville.
E. Cunningham,	Collingswood.	G. P. Matthewman,	Ottawa.
Edward Eidt,	Berlin.	H. P. Martin	Toronto.
Chas. Ferguson,	London.	J. W. Oakley,	Toronto.
A. Hugh Hipple,	St. Catherines.	Andrew Rose,	Picton.
J. T. Ireland,	Seaforth.	C. A. Risk,	Aberfeldy.
J. J. Kerr,	Campbellford.	J. H. Swann,	Toronto.
Geo. McDonald,	Arnprior.	A. J. Smith,	Prescott.
R. G. McLaughlin,	Brampton.	A. F. Webster, D. D. S.,	Toronto.

SOUTHERN MEDICAL COLLEGE.

DENTAL DEPARTMENT.

The Second Annual Commencement Exercises of the Dental Department of the Southern Medical Colleges was held in DeGive's Opera House, Atlanta, Ga., on Saturday, March 2, 1889, at 8 o'clock, P. M. The Annual oration was delivered by the Rev. Dr. Walker, and the valedictory by B. R. McBath, D. D. S.

The number of matriculates of the session was 36.

" " graduates 17, viz. :—

Name.	State or Country.	Name.	State or Country.
J. A. Arbeely,	Syria.	J. A. Link,	Georgia.
Aaron Branch,	Georgia.	S. M. Lido,	Georgia.
O. H. Cantrell,	Georgia.	S. L. Lane,	Alabama.
M. Z. Crist,	Kentucky.	B. R. McBath,	Tennessee.
J. W. Daniel,	Louisiana.	T. B. Pitcher,	Georgia.
J. W. Duke,	Georgia.	R. G. Ragan,	Alabama.
C. W. Forehand,	Georgia.	W. T. Sinclair,	North Carolina
H. J. Garland,	Georgia.	H. B. Williamson,	Alabama.
S. M. Hyman,	Georgia.		

COLUMBIAN UNIVERSITY.

DENTAL DEPARTMENT.

The Second Annual Commencement of the Dental Department of the Columbian University was held at Albaugh's Opera House, Washington, D. C., March 21, 1889.

The address to the graduates was delivered by Professor Hy. C. Thompson, D. D. S.

The number of matriculates for the session was 14.

" " graduates was 3, viz.:—

John K. Halley, . . Dist. of Columbia. Edith Jewell, ... Virginia.
Charles B. Munson, ... Virginia.

CENTRAL TENNESSEE COLLEGE.

SCHOOL OF DENTISTRY.

The Third Annual Commencement of the School of Dentistry of Meharry Medical Department of Central Tennessee College was held at Masonic Hall, Nashville, Tenn., February 21, 1889.

The valedictory was delivered by James R. Porter, A. B., D. D. S. and the faculty address by R. F. Boya, M. D., D. D. S.

The degree of D. D. S. was conferred on the following graduates by J. Braden, D. D., President of the faculty.

Name.	State.	Name.	State.
Thos. Aulston Curtis,	Alabama.	Jas. Bullock Maclin,	Louisiana.
Daniel Webster Fields,	Tennessee.	Jas. Reynolds Porter, A.B.,	Mississippi.
Stephen M. Hickman,	Tennessee.	Alonzo Maury White,	Tennessee.

UNIVERSITY OF TENNESSEE.

DENTAL DEPARTMENT.

The Eleventh Annual Commencement of the Dental Department of the University of Tennessee was held in the Masonic Theatre, Nashville, Tenn., on Tuesday, February 26th, 1889.

The valedictory was delivered by Robert D. Crutcher, D. D. S., and the charge to the graduates by Professor W. E. McCampbell, A. M., M. D.

The number of matriculates for the session was 22.

The degree of D. D. S. was conferred on the following graduates by Charles W. Dabney, Jr., Ph. D., President of the University:—

Name.	State.	Name.	State.
Chas. W. Alexander,	Tennessee.	Edward E. Slaton,	Alabama.
Twiggs R. Boger,	Georgia.	Samuel J. Spargo,	Tennessee.
Arthur J. Cottrell,	Tennessee.	J. C. Spivey,	Mississippi.
Robert D. Crutcher,	Tennessee.	Alirn S. Willis,	Tennessee.
Joseph B. Harris,	Mississippi.	W. M. Harris, (Honory),	Tennessee.
Eugene L. Holmes,	Mississippi.	James H. Moore,	Alabama.

THE

Dental Office and Laboratory.

FOURTH SERIES.

Vol. 43 PHILADELPHIA, JULY, 1889. No. 4.

CLEANING THE TEETH OF TARTAR.—HOW TO MAKE A NICE, CLEAN, THOROUGH JOB OF IT.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

In cleaning the teeth of tartar, especially where there is a large deposit of the light, creamy colored calculous, we are often met by difficulties in its thorough removal: as in the profuse flow of blood from the gums in the vicinity of the coated teeth; the inability, often, of seeing what is to be done, either from the shape of the mouth or the inability of the patient to open it sufficiently wide to afford access to it, or from the constant insinuating of the tongue of the patient over the teeth, thereby hiding the very parts it is necessary to have a clear view of.

When the tartar is of the hard, dense, greenish or brownish variety, the gums are not generally so apt to bleed profusely, and consequently do not thwart the operator in this respect, but, in any case, the plan we propose will be very effective in making a thorough job, as well as a neat and tidy one, for both the patient and operator.

When the flow of blood is profuse, as it generally is when there is a large deposit, our first procedure is to remove, superficially, all the tartar around about the lingual surfaces of the lower teeth from the second bicuspid on one side to the same tooth on the other side of the mouth. This being accomplished, we have the patient to rinse the mouth thoroughly until the bleeding ceases.

We then scribe on a piece of cardboard a line, representing the arch of the jaw, something in the shape of a horse-shoe, and laying this on a piece of rubber dam, equi distant from the edges and about midway from the top of the dam, we trace the form with a lead pencil on it. For the better understanding we will suppose a case to be cleansed.

The 2d molars remain, the 1st and 3d molars are lost, but all the other teeth are present. A hole is punched into the dam to cover each tooth. With the case, as above indicated, the dam will be punched, as shown by the following illustration.

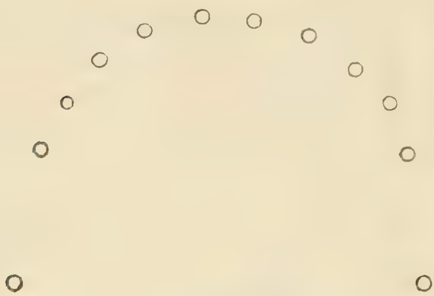

Fig. 1.

Passing the jaws of one "Tee's" broad flange, lower molar clamps through one of the holes, intended to encircle the 2d molar, we gather up the dam over the clamp forceps, and apply it to one of these teeth — preferably to the Left lower 2d molar. With a small ball end burnisher, (Fig. 2), we stretch the dam over the tooth and beneath the jaws of the clamp.

Fig. 2.

Having secured it thus, to one tooth, we next apply the rubber dam strap (Fig. 3) to keep the dam out of the way,

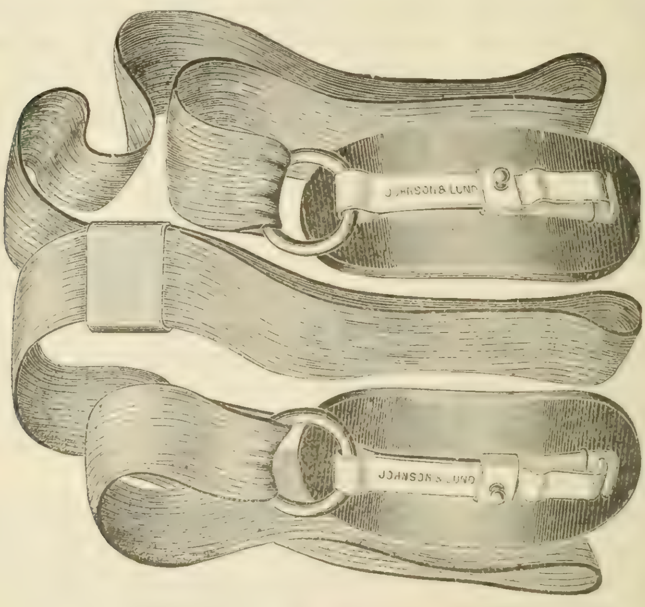

Fig. 3.

and then stretch it over the other teeth, *one by one*, until we have covered them all. To hold it securely in position we put on another clamp over the other molar, and then ligate each tooth, *one by one*.

Fig. 4 represents the dam applied to the teeth, as has been described.

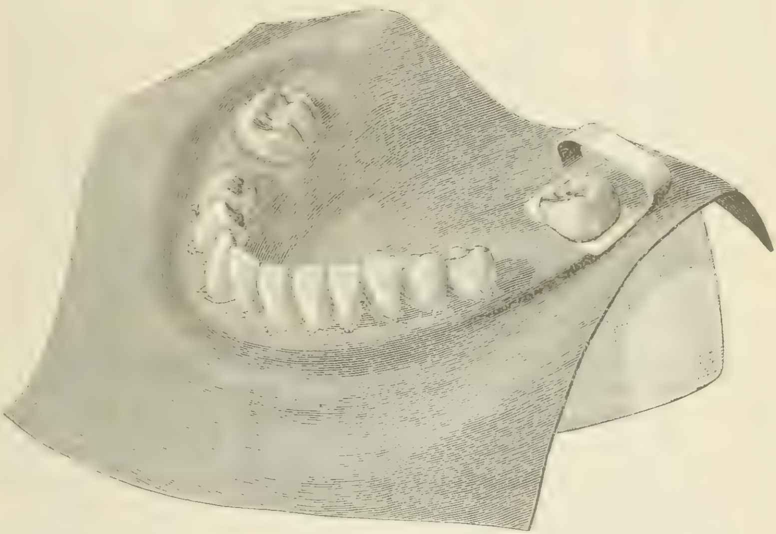

Fig. 4.

In ligating the teeth over the dam, we always put a knot in the ligature and let the knot rest on the lingual aspect of the tooth. This not only gives additional security against the dam slipping up, but affords an abutment on which to apply the end of an instrument to force the dam before the ligature, and thus get it applied well down on to the necks of the teeth, when we tie it, on the outside, next the lip.

Should the clamps, which were placed on the two molar teeth, pinch the gums, and thus give unnecessary pain or discomfort to the patient, they may be replaced by ligatures. In applying ligatures to these teeth, we usually make *a large knot*, and let this rest on the inside of the tooth next the tongue. Before removing the clamps we apply the ligature by passing this *over the bow* and under the jaws of the clamps, so that the ligature will rest well down on the neck of the tooth, and then we make a double tie on the buccal aspect of the tooth beneath the jaws of the clamp. We then lift the clamp off carefully

and tighten the ligature again, and tie it down a number of times, so that there will be a knot, to keep the dam from slipping, both on the buccal and lingual surfaces of the tooth.

When the dam is thus applied, each tooth being ligated, as described we commence the operation for the removal of the tartar. We presume it takes about fifteen minutes to apply the dam, as shown in Fig. 4. Thus protected, the operator is untrammeled. He has no blood to obliterate the work he has in hand; the patient cannot insinuate the tongue and thus interfere with the operator; there is no danger of wounding the gums with the scalers: the mouth mirror is not blurred by the breath of the patient; while every particle of calculus, even the smallest nodule can be distinctly seen and readily removed, with the scalers, by the aid of reflected light from the mirror or by direct sight.

As the tartar is removed the particles scraped off can be blown out of the way with the chip blower and the whole operation conducted in the neatest and most tidy manner.

After the dam has been on the teeth and ligated as described, it seems to work its way down and press the gums well away from the necks of the teeth. The ligatures around the ten anterior teeth may now be removed *one by one*, and each tooth more thoroughly cleaned, for it may be that the ligature, or the knot in it, may have concealed some small particle.

With the mouth mirror reflecting the light on the lingual surfaces, of the teeth, *every particle* of adherent tartar can be removed, either by standing behind the patient and looking down into the mouth, or else standing in front of the patient and by the reflection of the mirror. It will be found that the small instrument known as No. 15 of Corydon Palmer's nerve instruments (Fig. 5) makes an excellent scaler to remove the tartar between the teeth used from the front, where the ordinary sickle scalers will not remove it when used from their lingual surfaces.

Fig. 5.

We use but three scalers: two to remove *by pulling*, and one *by pushing*. Tartar will sometimes resist a most vigorous pull, while a slight push will disloge it. Fig. 6 represents the three forms.

The supplimentary cut over No. 1 represents the *under face* of the blade of the instrument, used for pulling—while the same in No. 3 shows the *upper face* of the blade, used for pushing. No. 2 is used chiefly for removing such particles of tartar as lodge on the crown or bulbous parts of the teeth.

1 2 3
Fig. 6

All the tartar being removed from all parts of the teeth, fine pumice mixed with water, may now be daubed over the outer and inner faces of the teeth, and, with one of the small polishing brushes, secured in a suitable mandrel and driven by the dental engine, the teeth may be gone over and thoroughly cleansed and polished. Fig. 7 represents the mandrel and brush.

Fig. 7.

After the ten anterior teeth have been cleaned, the two molars may receive attention. All adherent tartar may be removed from these *before removing the ligatures:* then remove the ligatures *one by one* and cleanse all such particles as may have been hidden by them.

We do not use the dam on the upper teeth for the removal of the tartar, as there is seldom any large deposit on these teeth as is found on the lower teeth. The first and second molars on each side are the teeth which show the largest incrustation, from their proximity to the ducts of Steno, but rarely to such an extent as to require the aid of the rubber dam for its removal. Should the gums bleed so freely in removing it from these teeth as to be a hinderance to the operation, its thorough removal may be accomplished in two or three sittings, and by the use of proper styptics or astringent washes as aids to the work. But the dam may be applied to the upper teeth for the same purpose in the same way as has been indicated for the lower teeth.

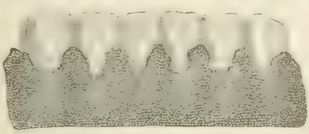

Fig. 8.

It will be found sometimes that the gums, particularly in the lower jaw, and extending at times from the bicuspids on one side of the mouth to the same teeth on the other side, are in such a highly hypertrophied condition, that they hang in loose, flabby folds between each tooth, and bleed profusely at the slightest touch. Such a condition is shown in Fig. 8.

When we find the gums in this condition we deplete them freely before we make any effort for the removal of the tartar.

For this purpose we use a pair of small and very sharp-pointed curved-blade scissors, as shown in Fig. 9.

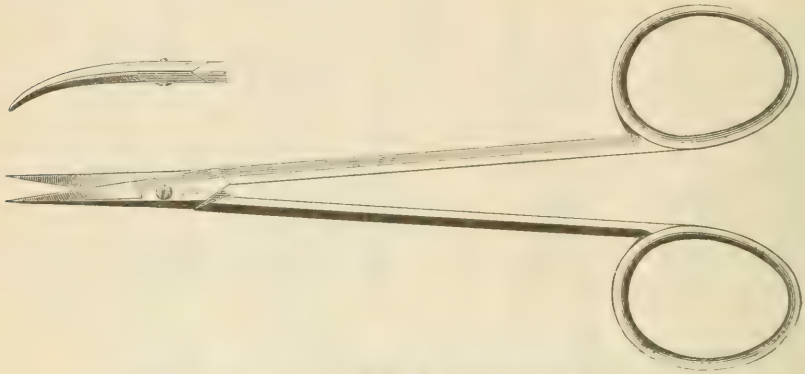

Fig. 9.

Spreading the blades apart, about as much as is shown in the cut, we snip off the gum between each tooth where it hangs loosely by a sort of quick pushing cut. The operation gives but little pain, as it is done so quickly. The hypertrophied gum, as thus removed, is shown between the central and lateral incisors in Fig. 10.

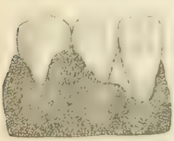

Fig. 10.

When all the tumified gum has been thus removed, between each tooth, where it hung loosely, with no adhesion to the tooth, the mouth is freely rinsed with cold water until the bleeding ceases. A swab is now made by wrapping a floss of cotton wool around the sharpened end of a piece of orange wood, and this is dipped into delequessed Iodide of Zinc, and all the depleted parts of the gums are freely swabbed with it. This drug is very astringent and tonic in its action, and in the space of a day or two it is wonderful to observe the very marked improvement in the healing and curative power it has had on the gums.

The rubber dam may be applied to the teeth after the gums are depleted, as above described, and the teeth subjected to a thorough cleansing by the process above advocated. If it had been attempted without this preliminary, the flabby parts of the gums would have forced themselves through the holes in the dam, thereby preventing it from being carried well down on to the necks of the teeth, where the tartar is generally located, and thereby preventing its thorough removal.

On the removal of the dam the gums may be again swabbed with the Iodide of Zinc before dismissing the patient.

To remove the *green stain* which is noticed at the gum margins, particularly in children of twelve or fourteen years of age, nothing is so effective as the use of the Tincture of Iodine, used on a stick of orange wood, followed by the use of powdered pumice and water and final polishing with polishing brushes in the dental engine.

A GUIDE FOR PUNCHING THE RUBBER DAM.

By T. F. Chupein, D. D. S., Philadelphia, Pa.

It is our practice, when several teeth are to be filled, to enclose them with the rubber dam. Some cavities, we all know, are excessively painful to excavate, while others are not at all so. Our object in, enclosing several teeth with the rubber dam, is for the purpose of giving the benefit to the patient as much as possible. There is nothing that we know of, which secures this immunity from the pain of excavating a cavity, as the dehydration of the dentine, so that by encircling several teeth with the dam, we may work on the insensitive cavity while the other is drying. Another object to be gained by this procedure is, that should we have a cavity so deep or in such close proximity to the pulp as to indicate the employment of a phosphate cement to act as a thermal pad, to prevent the shock incident to the taking of hot or cold food—the dryness secured by the dam gives ample time for the cement to harden, while work may be proceeded with on another cavity while this object is accomplished.

In punching the holes, in the dam, to apply it to the teeth, it frequently happens, that though care and apparent judgment seem to have been observed, that when this is applied to the teeth, the dam stands away, and does not lay smoothly over the patient's face, making anything but a neat application. We have lately made a device—which any dentist can make for himself—by which the application of the dam *can always* be made to lay over the teeth and face of the patients, smoothly—

Take a piece of stout paper and fold it on itself and sketch a line on it like one half the bottom of an impression cup. Fig. 1.

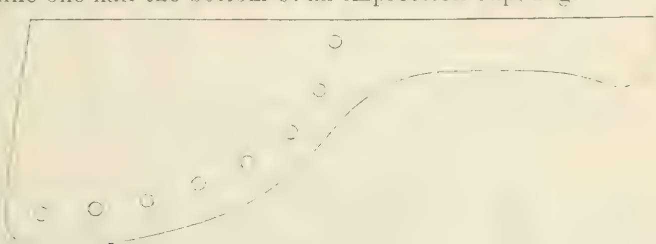

Fig. 1.

Draw on this at regular intervals small round marks as shown in the cut, and punch them out with the rubber dam punch.

When the paper is opened it will give a pattern as shown in Fig. 2.

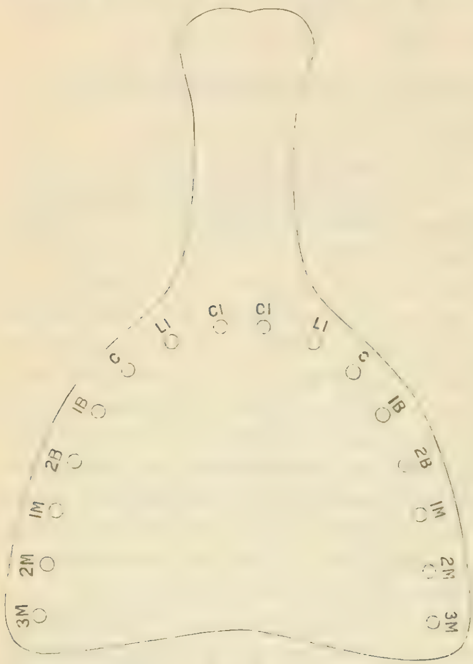

Fig. 2.

The pattern thus secured, it may be laid on a piece of *stout card board* and the form traced on it, and the holes punched out. The names of the teeth may be traced opposite each hole as shown in the pattern, Fig. 2. and this stouter pattern used as a guide to punch the holes in the dam. For use, the end of the handle is laid at the upper edge of the dam, and in the center of the piece; and holes punched through the dam, by aid of this guide, according to the teeth it is desired to encircle, *by holding the guide steadily against the dam while punching.*

If it is desired to punch holes in the dam to encircle the lower teeth, as recommended when using the dam for cleansing tartar from the lower teeth, it will be necessary to put the handle of the guide *about two inches* from the edge of the dam, so as to allow of a sufficient quantity of the dam to fall over the chin of the patient, as well as of a sufficient quantity to be taken upward over the upper lip to be secured by the rubber dam holder so as to be out of the way of the operator.

THE GYMNASIUM.—TRY IT AND BE CONVINCED.

By Theodore F. Chupein, D. D. S.

For several years past we have been in miserable health. A feeling of constant fatigue prevaded us. Walking along the streets was anything but a pleasure; as we felt an indisposition to any kind of exertion. We awakened in the morning unrefreshed by the night's

rest, and had to make considerable exertion to get out of bed. Morning after morning, we awakened with a violent headache, while frequent vertigo, dizziness and a bad taste in the mouth prompted our first act to clean our teeth as a means of relief for this. We rarely felt any good genuine appetite—but went to our meals mechanically or as a matter of form. The simplest diet disagreed with us, and we dosed our poor stomach, with, Strychnine, Nuxvomica, Arsenic, Speptine, Subnit of Bismuth, Bi-carb Soda, Ess Ginger, Oil Peppermint, Aromatic spirits Amonia and other drugs "ad nausia, ad infinitun." A constant cough and clearing of the throat beset us from our first waking, and at frequent and long intervals all during the day. Constipation was such: that nearly every other day—certainly twice a week, we had to resort to mild cathartics to assist nature. A cold chilly feeling was almost always present from early Fall to the beginning of Summer, and the slightest exposure, the most refreshing zephyr to other people—was sufficient to settle into a violent cold for us. We knew not what sweating meant—our skin was always dry and altogether our condition was unenviable. In desperation we thought to try the Gymnasium, and about eight months ago joined one. We may say as far as we are individually concerned that we have derived *infinite benefit from it*; and this article is prompted, to give others, who may be, as we were, the experience we have derived. Our age precluded "violent exercise" but such exercise as was afforded by "the chest weights," "the quarter circle," "the vertical bars," "the dumb bell exercise," "the wand exercise," "the muscular drill," "the Indian clubs," "the rowing machine" and "the running track," was enough to open our long closed pores and throw off, through the pores, the ill feeling, which had so long beset us.

At first it was a labor, despite the novelty. Many times have we, when on our way to the gymnasium said to ourselves (when we could scarcely walk; with no animation; and with our ever present headache——) "What is the use of our going? When we get there we will not be able to exercise, we have no strength etc., etc., etc." But we persevered; and although the lightest chest weight felt like a hundred pounds, and our poor flabby muscles seemed to revolt at the task; before we got through the allotted drill of 20 or 30 minutes, our headache was gone and we had a little more vim for a short walk in the open air. We had not been going more than a month when one of the members remarked to us that he noticed quite a difference in our appearances and movements. "When you first came" said he "I noticed you, and thought from your appearance and motion that you would soon drop off; but the exercise seems to have benefitted you,

for I noticed that your motions are more active, and your eyes, which were heavy when you came, are brighter and more animated." We were very careful at first not to overdo ourselves, as is frequently the case with those who embark in a new thing. We commenced the chest weights with very light weights and only a few numbers to each exercise. Then we increased the weights, and increased the number of motions. Then we increased the time and number of exercises. After this we procured a pair of dumb-bells, and a wand, and exercised *at home*. Every morning as we got out of bed, we went through the muscle drill, the dumb-bell drill and the wand drill This consumed about 10 or 15 minutes and we are free to say that for the past four or five months we have never had a headache, our digestion has been good, our appetite has been normal, our movements lithe and active—we have had but little vertigo (although of a bilious temperament) and our bowels have performed their natural functions without resort to medicinal agents. Our perspiratory glands seem to perform their natural functions, and now (so different from at first.) we perspire when going through the exercises; and so impressed are we of the benefits that we have derived from this cause, that we have purchased a " health lift " and if any thing like bad weather, or unforseen engagements prevent us from going to the gymnasium we have the means " at home " of going regularly and daily through the prescribed drill.

It must not be supposed, as the professor said, that as the weather gets warm that the exercises should be abandoned. The first perspiration induced by exercise does more to promote health by nature's effort, to throw off the vile emanations of the body through the pores of the skin, than any medicinal agent can do. " When I feel hot " he continued " I get cooled *by getting hotter through exercises;* and many times have I cooled myself off completely by going through violent exercise and thereby causing a free flow of perspiration." Dr. Thomas lecturing before the class said " that if his patients would take *more of his advice*, in the matter of gymnastic exercise, and *less of his medicine*, he felt sure they would be physically better off—but " said he " they seem to have an abiding faith in medicine."

We therefore give our experience, and truly believe that if any co-laborer feels, as we felt, and will give a trial to gymnastic exercise, he will, without doubt, feel the benefits of it. But to be of benefit it *must* be done regularly. It may be irksome at times, but you must force yourself to it. Do not force nature, do not more than your strength admits, but do a little, and little by little increase the exercise until new health, new vigor, new vim and new life are induced.

EXPERIMENTS WITH PHOSPHATE OF ZINC FILLING MATERIALS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

We have been making some simple experiments with Phosphate of Zinc filling materials with the view of ascertaining which of the materials experimented with was best suited for *setting crowns*. Our ideas in this have been, that for this purpose the dentist needs a material, that although mixed comparatively thin—say as thick as thick cream—it would set hard in from *five* to *ten* minutes after the crown was adjusted. It is exceedingly annoying to have to hold a crown in position for fifteen minutes, or perhaps longer, waiting for the cement to harden before being able to let the crown go, or to let the cement get wet; and it was with the view of overcoming this annoyance that we set about making these experiments, not only for our own satisfaction but for the benefit of all who use the Zinc Phosphate for this purpose.

We have observed that some of the materials on the market seem to possess the necessary quality *when first obtained*, but that they loose this after being on hand for some time. In correspondence with a manufacturer we learn that this is at present uncontrollable, on account of certain substances in the glazial phosphoric acid, of which the liquid is made, but which perhaps later experience, and later experiments may overcome.

We have likewise mixed the cement as thick as it is used for fillings and recorded the time of setting of each sample which has been sent us.

There are some cements that though mixed thin set hard almost instantly, such material is worthless, and are of no use either for crown setting or for filling teeth. As a rule considerable heat is evolved from such materials, and a trial should be made of them before using for either crown setting or for fillings. Such materials also never attain the density of good cement. It is granular, chalky and friable, and as we have said worthless for any use that the dentist has for it.

Although innumerable experiments have been made with this material, much remains yet to be learned by its manufacturers; whom we are told, that despite their experience with it, there is no absolute certainty that every batch will turn out the same, although the same care may be observed with each batch; and that frequently, large quantities of it have to be thrown away as utterly useless because, before offering it for sale it does not turn out, on being mixed, up to the standard of excellence they seek to obtain for it.

Below will be found the results we have observed:

OXY. PHOS. CEMENTS FOR CROWNS.

Giant cement mixed for crown setting—set hard in	8	minutes.
Brittin's Vit. " " " " " "	9	"
Weston's Ins. " " " " " "	18	"
Baldwin's Hyd. " " " " " "	22	"
Onyx " " " " " "	16	"
Welch's Phos. " " " " " "	25	"
Smith's Adamantine. " " " " "	8	"
Samson Cement. " " " " "	16	"
Justi's Insol. Cement. " " " " "	19	"
Caulk's Diamond. " " " " "	10	"
Dr. Flagg's Plastic Enamel. " " " "	50	"
Ash's Excelsior Cement. " " " "	25	"
Ash's Odontolith. " " " " "	18	"

OXY. PHOS. CEMENT FOR FILLINGS.

Giant cement mixed for fillings set hard in	6	minutes.
Brittin's Vit. " " " " "	6	"
Weston's Ins. " " " " "	8	"
Baldwin's Hyd. " " " " "	18	"
Onyx " " " " "	5	"
Welch's Phos. " " " " "	19	"
Smith's Adamantine. " " " "	5	"
Samson Cement. " " " "	12	"
Justi's Insol. Cement. " " "	9	"
Caulk's Diamond. " " " "	5	"
Dr. Flagg's Plastic Enamel. " " "	35	"
Ash's Excelsior Cement. " " "	15	"
Ash's Odontolith. " " " "	14	"

THE PRACTICAL PLACE.

TREATING SENSITIVE DENTINE.

"Some very broad claims are made for the use of heat alone; it is a reasonable method of treatment; a treatment that in most instances, perhaps, will be effectual, in all instances, if pursued to a sufficient extent. Frequent application of heated air, during excavating, will usually make the operation quite bearable by almost every patient. The use of an ether spray alone is of very little value in ordinary cases.

"After the excavation has been completed and thorough desiccation, then a solution of cocaine or heated carbolic acid may be used with decidedly good effect. After excavation and desiccation, a solution or varnish of gum mastic, or copal, may be applied to the walls of the cavity for the purpose of preventing a recurrence of sensitiveness after the filling has been completed. By this means, in most cases, entire freedom from a return of the sensitiveness is secured."—*Dr. J. Taft quoted in Items of Interest.*

HOW TO OBTAIN SMOOTH MODELS.

"After getting the impression in plaster, give it a coat of shellac varnish, not too thin, and while it is drying run a ring of sheet wax around it an inch or so deep. After the varnish is perfectly dry, instead of oiling, sprinkle powdered soapstone (or French chalk, so called) over the impression, then with a soft brush rub every part of it thoroughly, finally shaking out the surplus. Mix the plaster thin, and pour, tapping the cup gently until the plaster commences to set."—*Dr. C. C. Evarts in "The Ohio Journal."*

Dr. Swain, who highly commends the above, says: "This method will give you a model with a smooth, glazed surface; if impaired by making your trial plate upon it, it is readily restored by treating the model in the same manner just before closing the flask. A model thus prepared separates from the plate clean, and leaves a surface almost polished after vulcanizing."—*The Dental Review (Chicago).*

A NEW USE FOR ETHER DURING ANÆSTHESIA.

"Dr. H. A. Hare writes to the *University Medical Magazine* that if, during anæsthesia, respiration stops, he has found in a large number of instances, both in man and the lower animals, the free use of ether poured upon the belly causes so great a shock by the cold produced by its evaporation as to cause a very deep inspiration, which is often followed by the normal respiratory movements."—*The Ohio Journal of Dental Science.*

METALS FOR DIES AND COUNTER DIES.

"One word in regard to the metals, zinc, lead and Babbitt. Do not let them get mixed, for they are incompatible with each other Have a ladle for each. To keep your zinc in a nice, clean condition use muriate of ammonia as a flux, and you will always make a clean, smooth die.—*Dr. H. H. Newton.*

IODOFORM PASTE AS A PERMANENT ROOT FILLING.

C. C., writing to the *Journal of the British Dental Association* for December 15, 1888, observes:

"'Mr. Dennant . . . says 'he has us d in about a dozen cases an iodoform preparation* of Mr. Dennison Pedley's for filling pulp chambers and roots,' in cases where he finds it difficult to completely extirpate the nerve owing to an awkward curvature of the root, 'and desires an opinion as to its merits.' But he speaks of it as a dressing instead of a permanent root-filling. As such I have used it for about three years with very good results, not only in cases where I have devitalized and had difficulty in removing all the pulp, but also as a filling for roots and pulp chambers (or chambers only in difficult cases) for dead (abscessed) teeth. In fact, I have used it more for dead teeth, and I now never despair if I am unable to remove the whole of a decomposed pulp. I am sure that in using this iodoform preparation he will overcome one of his 'Failures.'"

THE SUCCESSFUL TREATMENT OF PULPLESS TEETH.

Mr. Dennison Pedley, referring to the iodoform preparation mentioned in the preceding note, remarks:

"To those who care to try the formula* given and the treatment adopted, it may be useful to state that the most important results have been obtained in the saving of very many chronic dead teeth, in which the nerves have lost their vitality before coming under notice, and where one generally finds the pulp chambers and nerve canals in an unhealthy, if not septic condition. With few exceptions I find it possible to fill such teeth at once, and seldom have failures. The same preparation of iodoform has proved very useful in 'capping' nerves after accidental exposure. I generally cover with a disc of metal to avoid pressure, and have often been struck with the fact that where the nerve has not remained alive the iodoform paste seems to have retarded decomposition and prevented putrefaction."—*The Journal of the British Dental Association.*

*The formula is as follows:

Eucalyptus Oil.. 2 parts.
Oil of Cloves... 3 "
Creosote..10 "

Into this gum mastic should be dissolved to saturation. After filtering through cotton wool, the solution should be thoroughly incorporated with iodoform in a wedgewood mortar until it becomes almost a solid mass. The oil keeps the preparation moist. Creosote, to a certain extent, disguises the smell of iodoform. The gum holds it well together, and one is enabled to introduce about twice the quantity as when dry.

ANTIPYRINE.

"Antipyrine in solution applied to the bleeding cavity left after extraction of a tooth is reported to have effectually arrested the hemorrhage after perchloride of iron had proved unsuccessful." —*Pharmaceutical Record.*

DESTROYING NERVES.

BY LYMAN C. BRYAN, D.D.S., BASLE, SWITZERLAND.

We are unfortunately obliged to go to press before we received from Dr. Bryan the corrected proof of his paper on this subject, which appeared in our last issue. The alterations which he made would have rendered his remarks even somewhat clearer than they were had we been able to embody them, and the following addition which we now give would have been more in place on page 190 than it is here. Dr. Bryan says:

"We have to depend largely on the prepared pastes sold at the depots, and of these I prefer Baldock's.

"The difficulty in preparing a nerve paste consists in the insolubility of the arsenic, or the preparation of an impalpable powder. Experiments which I have made with an expert chemist have only resulted in our getting a fine powder by dusting it through a cloth, after long pulverizing in a mortar. With one part of this powder I rub two parts of antipyrine and lanolin, to form a stiff paste.

"The lanolin, in a dry cavity, seems to penetrate the tissue, and to cause the antipyrine and arsenic to act, at first reducing actual inflammation of the part, and preventing further pain during the action of the arsenic.

A combination of—

Arsenic..1 part,
Antipyrine.....................................2 parts,
Lanolin..2 parts,

makes a painless devitalization possible."

OIL OF PEPPERMINT.

The use of oil of peppermint as an antiseptic appears to be gaining ground. The fact of its being non-poisonous would suggest its usefulness for dental purposes. Prominence was given to its value as a surgical dressing by Mr. Leonard Braddon in the *Lancet* some time ago. It is stated to be a powerful germicide, acting quickly, and,

while readily diffusible, does not evaporate so speedily as to be rapidly exhausted.—*The Dental Record.*

PHENOL CAMPHOR.

Phenol camphor, which has lately been employed in the treatment of wounds, is prepared by dissolving three parts of camphor in one part of carbolic acid. This produces a rather thin, clear, yellowish liquid, with a strongly camphoraceous taste and smell, which mixes readily with fatty, alcoholic and ethereal liquids, and easily dissolves cocaine, salicylic acid, iodoform and other bodies. Phenol camphor prevents suppuration; it combines the cooling effects of camphor with the antiseptic properties of carbolic acid, and, unlike the latter, is painless in its action, and does not show acid properties.—*Ztschr. Apoth. Ver.*

IMPRESSION TAKING.

Modelling composition may be classed next to plaster-of-Paris as an impression material. Fortunately it has qualities which indicate its use where plaster-of-Paris is wanting. Teeth standing at different angles or with large crowns and small necks are taken best with modelling composition.

Now, if we could make a combination of these two materials in obtaining an impression in such a manner that only the best qualities of each would be used, we would obtain much better results than by the universal use of any one material; therefore, I have a method to present which I have been using for some time with the most satisfactory results. It is especially applicable in partial upper cases.

With a spatula made of a material which can easily be bent in any shape, as of block tin or impression tray material, plaster-of-Paris of the usual consistence for impressions is carried to the roof of the mouth and there spread upon the mucous membrane as far back as its desired to make the plate; more plaster is added to this until it is even full down to the necks of the teeth. The lower surface is to be roughened for a purpose which will appear further on. Water for modelling compound being heated, in the meantime the impression tray is filled with one-half the usual amount of the composition and placed in position against the teeth and plaster core, which, by this time, has become hard. When cooled remove and varnish both parts. When the varnish is dry oil the plaster core only, as modelling composition separates more nicely when varnished than when oiled. From this procure the cast in the usual way.

The advantages of such a procedure are, first, the plaster and modelling composition are each manipulated in such a manner that the best qualities only are used; second, the plaster being placed in position against the mucous membrane in its softest state is allowed to harden without any pressure, as is required when using a tray; and third, the plaster is completely under control, and is allowed to extend no farther back than is necessary, so that gagging is largely prevented.—*Ohio Journal.*

A Russian dentist recommends $2\frac{1}{2}$ grains of gum mastic (globules) and 1 grain of paraffine to be molten together and made into sticks, for fastening broken plaster teeth or models. The stick should be softened and some of it put on both of the broken parts.

DIGESTION OF CARBOHYDRATES.

In a series of experiments recently carried out by Drs. Stutzes and Isbert (*Zeitschrift fur Physiolog. Chemie*) it was ascertained that the largest amount of digestive action was exerted on carbohydrates by treating them first with ptyalin, then with pepsin and lastly with pancreatin. It was found also that ptyalin, contrary to the usual belief, acted to a slight extent upon albuminous food, that neutral ptyalin solutions acted even more strongly than feebly alkaline solutions, and that diastase solutions produced nearly as good an effect as those of ptyalin. This is an important fact, clinically, for ptyalin is an expensive ferment, while malt diastase is comparatively cheap. Ptyalin solutions, alone, are more active than diastase, but when followed by a pepsin solution the digestive power of the two is just the same. Pancreas solutions were found to act more feebly on carbohydrates than either ptyalin or malt diastase. The malt diastase, followed by a pancreas solution, digested less actively than did the ptyalin and pancreas series. The general results of the experiments go to show that the saliva has an important role in digestion, and that, when it is not properly secreted, malt diastase can supply its place. It would also seem that the best time to take the malt is either just before or just after meals.

EXPORT OF INDIA-RUBBER FROM BRAZIL.

During the past year the exportation of india-rubber from Brazil amounted to more than 15 millions of kilograms of which 10,110,000 kilograms were shipped to this country, and 5,280,000 to Europe.

LOCAL ANÆSTHETIC.

Liquefied Chloride of Methyl as a Local Anæsthetic.—At a recent meeting of the Society de Biologie, M. Gallipe (Bulletin Medical, No. XI., 1888) stated that for the last two years he had been employing liquefied chloride of methyl, dissolved in ether, by means of a hair pencil or a medicine-dropper, as a local anæsthetic, with the best results. By its aid he has been able to practice section urethral strictures, open abscesses, incise the skin, and even draw teeth, without experience of the least pain on the part of the patient. In the latter case the only difficulty is experienced in the extraction of the last molars of the upper and lower jaws. Sometimes he has found sloughing of the mucous membrane to follow as the result of the application of the chloride of methyl; but this is rarely the case, and when it does occur it is but superficial. In acute periostitis the application of chloride of methyl is often painful by implicating the neighboring teeth, and the anæsthesia is obtained with difficulty; but, nevertheless, the pain of the extraction of the teeth is greatly reduced. He has also employed it in opening alveolar abscesses and in various operations within the mouth. Finally, he claims that the hemorrhage, which is often troublesome after the extraction of teeth or operations upon the mouth, is really controlled by the application of liquefied chloride of methyl.—*Therapeutic Gazette.*

SAPONACEOUS TOOTH POWDER.

Prepared chalk	4 ozs.
Carbonate of magnesia (heavy)	4 ozs.
Castile soap, powdered	1 oz.
Oil of rose	6 drops.

ROSE TOOTH POWDER.

Prepared chalk	1 lb.
Precipitated chalk	1 lb.
Oil of rose	½ dram.
French carmine	1 dram.

AROMATIC TOOTH POWDER.

Precipitated chalk	16 ozs.
Prepared chalk	8 ozs.
Orris root	1 oz.
Essence of vanilla	½ oz.
Strong tincture of cinnamon	½ oz.
Simple tincture of benzion	½ oz.
Oil of rose	16 drops.

PAINLESS DEVITALIZATION OF PULP.

Dr. Shattuck's plan is to take arsenious acid, put it into an ounce vial and pour creosote on the arsenic—a little more than will cover it. When you wish to use the paste, tip the bottle so you can reach the arsenic and apply directly to the pulp: or you may take a pellet of cotton and apply that way. The paste prepared in this way is ready for immediate use, and will stop the most violent toothache in about five minutes. The addition of other drugs he regards as a detriment to the paste.

MECHANICAL CURE FOR HICCOUGH.

C. J. Strother called attention at a recent meeting of the London Chemists' Assistants' Association to a cure for hiccough discovered by a surgeon in the India service whose name he could not recall. The speaker explained that in hiccough the glottis is closed and a slight spasmodic contraction of the walls of the thorax takes place. To overcome this, procure a glass of water and pour a little of it down the patient's throat. While he is drinking the water he should press a finger on the orifice of each ear. By this method the glottis is opened, and in five seconds the thing is done. Should by any chance an obstinate case be met with, it may be taken as assured that the throat and ears were not closed at one and the same time: either the water was swallowed before the ears were thoroughly stopped or the water was not sufficient to fill the throat. Another precaution is to keep the chin well up.

INCOMBUSTIBLE CELLULOID.

It is well known that the commercial value of celluloid is greatly lessened by the fact of its easy inflammability, which has repeatedly given rise to serious accidents. A process of manufacture which does away with this injurious property, at least to a considerable extent, has been patented by Stockler. His preparation is a mixture of 100 parts of gun cotton with 40 parts of camphor, and 70 parts of chloride of zinc. This is moistened with 100 parts of alcohol, and allowed to stand for 12 hours, after which it is kneaded by rollers into a homogeneous mass. This celluloid, the inventor claims, will burn only while in direct contact with flame, being immediately extinguished on the removal of the latter.

CIGARETTE SMOKING FOR BOYS.

A leading New York physician of wide experience states as his

opinion (*Med. Record*) that "as matters are going now, cigarette making rivals the liquor trade in its pernicious influence upon the rising generation."

TREATMENT OF WARTS.

Children often suffer from unsightly warts on the hands, which cannot be removed by caustic. G. B. Pullin, of Sidmouth (Bristol *Medical Journal*), recommends in such cases the administration of two or three minims of liq. arsenicalis twice a day. In a week or ten days, he says, the warts will disappear.

ABOUT PLATE WORK.

Dr. J. P. Campbell spoke at length on the subject of prosthetic dentistry. He regretted the tendency of the profession to slight this branch, which he considered of great importance, because of their many failures. He had studied it closely, having averaged 300 plates a year, for the last five years, and never had one "to go back on him."

The prosthetic dentist requires, in the highest degree, mechanical judgment, especially in the matter of impressions. Much depends on the proper cup and proper position of the patient. He has a hole in the cup, through which he can pass his finger and put the plaster in every direction, putting wax around the posterior portion to keep it from running back. He washes the impression with glycerine soap as a glazer. He always uses an air cell, placing it exactly central, from side to side and from back to front, cutting with his knife a little ridge with beveled walls. With a flexible mouth, a deeper air cell is needed. In that way all difficulties are overcome. He articulates in the mouth, building on nature's foundation, studying the color of the eye, the complexion, etc. He uses plain teeth for temporary work, and gum sections for permanent.

Dr. Carpenter asked how long after taking the impression before his plates were ready for the mouth.

Dr. Campbell replied five or six hours. He could finish three sets in a day, but preferred only to make one. On one occasion, when the mouth had been prepared by another dentist, and everything was ready for him to go to work without any interruption, he put in 125 plates in 90 days. Uses vulcanite rubber altogether. Made gold plates formerly, when nothing else was used, and had made continuous gum, but preferred vulcanite as universally satisfactory. Uses the Samson rubber, and as little as possible to the plate. Uses paraffine wax as case, and trims off to have it as thin and light as possible.

Runs the thermometer up to 300° in 35 minutes, then raises it slowly to 320°, and holds it there for 50 minutes.—*Extract from proceedings of Georgia State Dental Society, in Southern Dental Journal.*

POLISHING DEVICES.

DR. F. A. WILLIAMSON, FORT SCOTT, KAN.

Some simple devices, well tested in my own laboratory in polishing plates, may help others in both economy and convenience:

In using sand-paper, if you have not the split mandrel, fit one of hard wood to the lathe, if practicable; instead of allowing a flapping free end, wind a piece of proper width on the mandrel a couple of folds and cement the end down with, say Spalding's glue, tie and lay aside a few for future use. A little of old rubber dam, folded inside will make the cylinder more pliable. For reaching an angle and for rapid work, take an old cork, turn it to any desired shape on your lathe with a file, glue on a covering of sand-paper and tie firmly in place till dry.

The cone of pumice-stone which Prof. Harper brought to our attention I think better for general use; but it is more satisfactory to me with a simple bushing which I give it. After blocking it out with an old saw, and shaping with hatchet or chisel, I bore with any convenient instrument a perforation a little larger than the spindle to which it is to be fitted, wrap the end of the spindle with tissue paper moistened with Spalding's glue, and screw in place; when dried, place and turn to desired shape with an old file, resting one end of it on lathe bench.

For applying polishing powder I have found nothing superior to wheels cut from the fragments of the heaviest machinery bands made of rubber and cloth. If the smaller size of these do not reach some spot, punch one out of sole leather and place on the dental engine; while the accessible parts of a plate will be brought to a polish with a two and a half inch diameter wheel of the band material as if by magic.—*Archives.*

PREVENTING AN ABSCESS.

The apical foramen is the only inlet and outlet of the pulp canal and when perfectly stop the work is done, and the more quickly you stop it the better will be the chances for success.

Always place the dam about the tooth before opening the pulp chamber, and use nothing but carbolic acid crystals with enough alcohol to make them liquid, using smooth broaches to work it into the canal and

by these means clean carefully; when cleaned use hot air to dry. The canal is now ready to be filled. This is done by pumping in gutta-percha dissolved in chloroform and with points made of orange wood. Be sure the first point entered goes to the apex. The root canal can by these means be well filled, and if any bugs remain alive after the dose of acid, hot air and chloroform, they may eat the gutta-percha, for this is the only harm they can do.—*Dr. J. D. McCulloch.*

WORTH REMEMBERING.

It is not what we earn, but what we save, that makes us rich. It is not what we eat, but what we digest, that makes us fat. It is not what we read, but what we remember, that makes us learned. All this is exceedingly simple, but well worth keeping in mind.—*The Practical Dentist.*

60 drops is equal to	1 teaspoonful.
4 teaspoonsful is equal to	1 tablespoonful.
2 tablespoonsful is equal to	1 ounce.
4 tablespoonsful is equal to	1 wineglass.
2 wineglassesful is equal to	1 gill.
4 gills is equal to	1 pint.

CARBOLIC ACID IN IN-GROWING NAILS.

Daniel's Texas Medical Journal makes the following statement:—"We see tannin—a saturated solution, much praised as an application to in-growing nails—but its effect is nothing to compare with the prompt and satisfactory action of pure carbolic acid. The inflamed part may be as tender and as sensitive as an inflamed eye, and one application of carbolic acid, poured or dropped from the vial directly on it, so as to penetrate under the nail, will relieve the pain almost instantly; and if applied at bed-time, next morning the part will be as insensible to the touch as wood. After this the corner of the nail can be clipped off, or allowed to remain, and an occasional application will prevent the recurrence of the trouble."

THE FLEA.

Fleas love dirt, and in it they flourish and multiply most abundantly. But in spite of St. Dominic's curse and their unclean haunts they are interesting little fellows. Let us put one under the microscope. It seems to be clothed in a sort of armor formed of brown overlapping plates, that are so exceedingly tough as to be almost indestructible. Its head is small and very thin, and it has a single

eye upon each side. This eye is black, and the rays of light scintilate within it like sparks of fire Puget managed to look through one of these eyes and he found that it diminished objects in size, while it multiplid them in number—a man appearing like an army of fairies, and the flame of a candle becoming a thousand tiny stars. From the shape of its head, and for other reasons, the flea is supposed to use only one eye at a time. The offensive weapon of the flea is composed of two palpi, or feelers, two piercers, and a tongue. When it feeds it stands erect, thrusting this sucker into the flesh, and it will eat without intermission until disturbed, for it voids as fast as it swallows its food. It is interesting to put several in a glass, and, giving them a piece of raw meat, see them all standing on their hind legs to suck up its juices.

Their manner of breathing is still undetermined, but it is thought most probable that they receive air into their bodies through small holes at the ends of the palpi.

The legs of a flea are marvels of strength and elasticity. They are joined to the body by long tendons that act like wire springs. In making its leap, which, it is said, can cover two hundred times its own length, the flea draws the legs close up to the body, and then throws it out with great force; but the impulse proceeds from the first joint alone, the others only increasing it by their stretch while the leap is being made.

Fleas are possessed of great strength. Mouffet tells of a mechanic who made a gold chain, as long as his finger, that a flea dragged after him, and a golden chariot, which he drew also. Bingley writes of a watchmaker in the Strand who had an ivory four-wheeled chaise, with a coachman on its box, drawn by a flea. The same man afterward made a carriage, with six horses, a coachman, four persons inside, two footmen behind, and a postillion on one of the horses, all of which were drawn by a single flea. Latrielle mentions a flea which dragged a single cannon, of twenty-four times its own weight, mounted on wheels, and showed no fear when it was charged with gunpowder and fired off. Rene says that he saw three fleas drawing a tiny omnibus; that a pair drew a chariot, and that a brass cannon was dragged by a single one.

There are several varieties of fleas, but they are so much alike that their differences are interesting only to scientific people. The cat flea will do as well as any to show us the process of breeding. During the spring and summer months she simply drops her eggs into the fur of the cat, but in the autumn and winter she glues each firmly upon a hair. These eggs are so small as to be barely visible to the naked

eye, but under the microscope they are very beautiful, looking like the loveliest pearls, and are perfectly translucent. The flea deposits nearly two hundred at a time, running about and dropping them here and there. They soon hatch into small, white, footless worms. In from one to two weeks they go into cocoon. Nothing can be prettier than this cocoon. I wish I could show it to you, but will try to describe it. It is like a flask of clear glass, tinged at the edges with pearly tints, and dotted over with gold. The little sleeper within lies in a circle, is rose-colored, and looks like the delicate petal of a flower. In about six weeks he reaches maturity. At first he is not larger than a mite, but when well fed grows quickly in size and strength.

Fleas are quarrelsome and great fighters. When several are confined in a glass they will stand on their hind legs, striking at their opponents with the others, and roll over and over each other, losing legs and antennæ, and at last giving up their lives in the fight. There is a record of a flea which lived ten days after such an encounter, with no antennæ, three plates of his side broken in; one eye gone; and with only four legs, and these cut off to the first joints.

Fleas are supposed to feel a great antipathy to worm wood and other bitter herbs; and in England the country people have a habit of placing these about their cottages for the purpose of banishing the lively little pests.—*S. L. Clayes, Swiss Cross.*

FOR SWOLLEN FEET.

Policemen, mail carriers and others whose occupation keeps them on their feet a great deal, often are troubled with chafed, sore and blistered feet, especially in extremely hot weather, no matter how comfortably their shoes may fit. A powder is used in the German army for sifting into the shoes and stockings of the foot soldiers, called "Fusstreupulver," and consists of 3 parts salicylic acid, 10 parts starch and 87 parts pulverized soapstone. It keeps the feet dry, prevents chafing, and rapidly heals sore spots. Finely pulverized soapstone alone is very good.

INCIDENTS OF OFFICE PRACTICE.

Dr. Geo. S. Allan, under the above heading says; in *The Dental Cosmos* for May, 1880. "I would here say that I use mercury bichloride rather freely. It is one of the most common germicide agents that I now have in my office. I keep a one per cent. solution, and when wanted I dilute it with rose water instead of ordinary water, and the disagreeable taste which the patients complain of so much is prevented. In abscess cavity, or the deep pockets in cases of pyor-

rhea alveolaris, can be syringed out and the patient will hardly notice the taste; whereas, before I used the rose water they would grumble exceedingly about the horrible bug-poison taste of the bichloride."

* * * * * * * *

"I have seldom used it stronger than one to one thousand. In pulpless roots I use it stronger, even a one per cent. per hundred, but not to wash out a pocket, or anything of that kind; in such cases I never use it over one to five hundred, more frequently one to one thousand, or even one to two thousand."

To make a 1 per cent. solution of the bichloride add one ounce of water to $4\frac{1}{2}$ grs. of crystals.

To dilute the above for a strength of 1 to 500 add 10 drops of rose water to 2 drops of solution.

For a strength of 1 to 1000 add 20 drops rose water to 2 drops of solution.

For a strength of 1 to 2000 add 20 drops rose water to 1 drop of solution.—ED.

OBTUNDING OF SENSITIVE DENTINE AND CONTROLLING PERIDENTAL INFLAMMATION BY ELECTROLYSIS.

BY DR. F. McGRAW.

The system of obtunding sensitive dentine to which your attention is called has these points in its favor: It is safe, it does all that is claimed for it, and it is not patented.

To a twelve per cent. solution of cocaine add an equal amount of absolute alcohol. In connection with this, use the galvanic current, varying the power as the needs of each case may indicate. The method of application is as follows: After applying the rubber-dam, wet a pledget of cotton in the solution; place it in the cavity of the tooth; press the points of the positive pole on the cotton and the negative pole, with sponge attachment thoroughly wet, to the cheek, turning on the current. Rarely will more than four cells be necessary if the battery is in good order.

An application of three minutes, with an interval of like duration, and then another three minutes application, is sufficient in the majority of cases, though occasionally it is necessary to make the third application; then dry the cavity thoroughly and begin excavating.

His deductions as to the physiological effects are that the galvanic

current acts as a vehicle for conveying the medicinal agents. The cocaine cement anæsthetizes the odontoplastic cells and the pulp. The styptic properties of the alcohol act upon the dentinal fibrillæ, which are of an albuminous nature, causing contraction and increased density and firmness. His reasons for these conclusions are as follows: He had found that even in the most sensitive teeth the pain was obtunded; that after a certain time had elapsed the sensitiveness would return, but never to the degree which existed before the application of the obtundent. His conclusion from this was that a change had taken place in the dentinal fibers which he thought was due to the styptic qualities of the alcohol, and not to the electrolytic action of the galvanic current.

A devitalized tooth is not a conductor of the electric current.

In the case of peridental inflammation he directed that a stronger current should be used, which he claimed would tetanize the vessels and cause a diminished flow of blood to the parts and thus lessen congestion. The same current longer continued will cause electrolytic decomposition.

The medicinal agents which he uses for peridental inflammation and for blind abscesses are a saturated solution of the chloride of sodium seven ounces, tincture of ergot one ounce. The chloride of sodium is a constituent of the blood, keeping the fibrine and albumen in solution. In an inflamed condition the tissues lack this ingredient, which we supply artificially. The tincture of ergot stimulates contraction of the blood-vessels and causes anemia. Taken together, the combination decreases the flow of blood, reduces congestion, and furnishes an element which is lacking and upon the presence of which normal conditions depend. The treatment of blind abscess requires stronger battery power in order to obtain the full effect of electrolysis.

This method has been extremely successful in the painless removal of pulps in the hands of Dr. Week's as well as in my own, and you will find in it an agent which will give satisfactory results when followed.—*Dental Cosmos.*

A SUGGESTION FOR VACUUM CAVITIES.

By Frank M. Newell, Mansfield, Pa.

We think we have hit upon an improvement to Dr. Alfred Peete's method of making the "Vacuum Cavities,"—which by-the-way is an excellent suggestion in many cases.

Instead of driving round-head tacks into the cast, we make the plate over a smooth cast in the usual manner; then with the engine and a round burr of suitable size, we can make the little cavities in less time

than it takes to drive the tacks into the cast, and no danger of warping the cast as might result from too long tacks.

A little caution is necessary not to drill through the plate. In this way the "cavities" can be applied to old as well as to new dentures.

We would also like to suggest a method for making smooth models or casts. As soon as the impression (which is taken with plaster) is removed from the mouth, immerse in cold water till no more air bubbles rise from it. Then with a soft brush lather thoroughly with soap, and with dry brushes (we use common 1 inch flat paint brushes) brush off superfluous lather till surface of impression is smooth and dry. Mix the plaster for the cast about the same as for impressions and pour into the impression, being careful to jar down thoroughly by rapping the cup on the bench or edge of the plaster bowl. As soon as the plaster is set, remove the impression, and before putting base plate on the model give it a thin coating of liquid silex. After packing the plate, before closing the flask to vulcanize, give the model one more coat of silex and the plate will have a smooth palatel surface.

BOOK NOTICES.

The Principles and Practice of Dentistry; including Anatomy, Physiology, Pathology, Therapeutics, Dental Surgery and Mechanism —by Chapin A. Harris, M.D., D.D S., late President of the Baltimore Dental College, author of "Dictionary of Medical Terminology and Dental Surgery." Twelfth edition, revised and edited by Ferdinand I. S. Gorgas, A.M., M.D., D.D.S., author of "Dental Medicine," etc. With one full-page plate and 1,028 illustrations. Octavo, 1,212 pp. and index. Philadelphia: P. Blakiston, Son & Co. 1889. Price, cloth, $7.00; leather, $8.00.

This admirable work has gone through twelve editions. This of itself is sufficient comment to show the value and just appreciation of the work by the dental student and the dental practitioner, and of its general acceptance as a text-book by the various colleges of dentistry throughout the country. When we compare the present edition to the *second edition*, over which we poured in 1847, when commencing the study of dentistry, and see the marked improvement in the typography, the cuts, and the general get up of this justly celebrated book, we can easily appreciate the many advances made in the profession and the great strides it has made in the last four decades. Such a work should be in every dental library. For, though a good tale be none the worse for being twice told, there are many subjects in this work so well brought out, so clearly written, so nicely told, that it is a pleasure to go over the old ground. We are glad to see that many

of the cuts in this edition are new and truly embellishments to the work, and we trust that by the time the popular demand and the advances in the profession will call for still another edition such abortions of cuts as appear on pages 98, 99, 101, 102, 103, 969, and other pages of the work, (all of which were in the second edition, and which have since been used in every subsequent edition) will be expunged, and new ones made, as being unworthy a place in the pages of a book so justly valuable.

ED.

Alden's Manifold Cyclopedia of Knowledge and Language.—New York. John B. Alden, Publisher. 50 cents, cloth; 65 cents, half morocco. Postage, 10 cents on each volume.

We commend the above work to both the general public and to the reading dentist for the many points which it possesses. It is of a handy size. The type is clear and easily read. The page is narrow, so that the eye follows line after line with facility. It is not merely a cyclopedia, but is a general dictionary as well, and is edited with talent second to none in this country. The work is published at such a reasonable price that it may be had by all without feeling the expense. With these and the many other points of excellence which it possesses, we recommend the work as a valuable additon to the library. ED.

Dental Science—by Luman C. Ingersoll, A.M., D.D.S., Dean of the Dental Department of the State University of Iowa from 1882 to 1888. Second Edition. Published by the Wilmington Dental Manufacturing Co., Philadelphia, Pa., 1889.

The above work comes to us in its second edition. The style is clear and forcible, and being categorical, serves to impress the student and rivets his attention. It is arranged in three chapters—"Dental Materia Medica," "Dental Physiology" and "Dental Pathology and Therapeutics," and, being interleaved, gives the student an opportunity of making notes while he is studying and listening to lectures.

ED.

Dental Medicine.—A manual of Dental Materia Medica and Therapeutics. By Ferdinand I S. Gorgas, A. M., M. D., D. D. S., Editor of "Harris' Principles and Practice of Dentistry" and Harris' Dictionary of Medical Terminology and Dental Science. "Professor of the Principles of Dental Science, Dental Surgery, Etc., in the University of Maryland, Baltimore." Third edition. Revised and Enlarged. Philadelphia: P. Blakiston, Son & Co., No. 1012 Walnut Street. 1889.

It is only within a few years past that this excellent work was offered to the profession, and its merits were so well appreciated that we record the publication now of the *Third Edition*.

The present edition is much improved in the arrangement of the subject matter, also the additions made to a number of subjects treated in the work, such as the Diagnosis of the Affections of the Mouth, General and Local Anaesthesia, the Action of Arsenious Acid as a Devitalizing Agent. The action of Antiseptic Agents, the Digestibility of Foods. A number of new formulae, the index to Dental Diseases and Remedies, etc., etc.

ED.

TEETH WITH DEAD PULPS, WITHOUT FISTULE, AND THE FILLING OF ROOTS —ITEMS OF INTEREST.

BY DR. C. T. STOCKWELL, SPRINGFIELD, MASS.

My treatment of teeth with dead pulps, with or without fistule, has, for some years, been based on the theory that, practically, we have to deal with a *single*, agent—sepsis.

To simply "vent" is often sufficient to afford relief: but if a thorough elimination of debris can be accomplished, more sure and quicker results are, in my practice, obtained. Mere instrumental elimination is not enough. Nothing short of the solvent and mechanical action of H_2O_2 is sufficient; and this should be continued so long as application to the pulp canal results in its peculiar manifestations of action.

According to my own experience with blind abscess we are "warranted in proceeding to fill the root" whenever we have secured certain conditions, whether a few minutes or a few days time is required to bring about these conditions; and when once obtained, we may proceed to "permanently close the aperture through which any abscess *has had* vent or drainage" at once

The method is practically the same as in the treatment of acute cases. Attention is first directed to the elimination of putrescible matter and the destruction of the septic agents, believing them to be the direct antecedents of the troublesome condition; and that if they are removed nature is left free to proceed uninterruptedly with the process of repair.

From a long and almost daily use of hydrogen peroxide, bichloride of mercury, iodoform and eucalyptol, I am convinced that they are not simply antiseptic, to use the word as heretofore generally understood, but that they are also *antipyogenic*, if I may adopt such a term. By this expression I wish to convey the thought that these remedies

not only destroy the organisms of fermentation and putrefaction, but that they also destroy the pyogenic fungi that are the direct antecedents of pus formation. However this may be it affords the best theory that I am able to advance to account for the facts of my almost daily experience.

No species of bacteria finds a comfortable or favorable soil for its proliferation within the range of the penetrating and persistent influence of eucalyptol and iodoform, especially when used in combination. And if the material used for root filling is composed, to any considerable extent, of iodoform, no one who is at all familiar with its action can conceive of its influence as being confined within the limits of the pulp canal. It extends to, and markedly influences the pyogenic tissues beyond the apical foramen.

If, however, the local or systemic conditions are such as to cause an apprehension of continued trouble, an artificial fistule may be established at once. Teeth with dead pulps, with a fistule, are cases that readily and promptly yield to the proper treatment. After treating hundreds of such teeth, by a method that was adopted some two years since, I am ready to "dogmatically" assert that a large majority of such cases may as well be treated and permanently filled at a single sitting as after a week of sitting—provided, of course, that the sitting is sufficiently long to enable one to secure the desired result; viz., the elimination of all such matter as a reliable preparation of peroxide of hydrogen is capable of acting on. I know of no better test for this condition than the non-action of this remedy. In the treatment of blind abscess, as well as of abscesses with a fistule, after the condition is secured when no action is manifested on the injection of H^2O^2 into the pulp canals, I am thoroughly convinced that nothing more or better can be done *at that point* other than to proceed, at once, to fill the root with a non-irritant and antiseptic material or combination of materials, one of which shall be iodoform, the powerful and almost ideal antiseptic. But, as previously stated, if there remains an apprehension of further trouble, it is easy to establish a fistule for drainage or vent, and also to gain direct access to the pyogenic tissues through which medicaments may be administered. By the use of cocaine or pure carbolic acid, applied to the gum, an incision can be made to the bone with scarcely any pain to the patient; after which an opening to the apex of the root, by the use of a sharp drill, is easily accomplished. If this is done as the first step in the treatment of blind abscesses, the gases that result from the action of the H^2O^2 on the contents of the cavity beyond the apical foramen—should there be one—will find ready escape, thus avoiding any pain consequent on the

pressure of such gases on the surrounding tissue. The occasion, however, for forming a fistule in this manner, in my practice, I have found to be exceedingly rare.

I have used H^2O^2 with great freedom for several years with not a single instance of inflammation. I should consider acute inflammation, resulting from the use of a reliable preparation of H^2O^2, would be about as exceptional as the phenomenon of poisoning by strawberries.

WHAT I KNOW OF COCAINE.

DR. L. H. HENLEY, MARSHAL, TEXAS.

There's not a blessing given to man that he cannot and occasionally will not abuse. We can get grand results from Cocaine, but we must learn to master it. Cocaine is a blessing, and it has come to stay. At first I handled it with the utmost care and suspicion. I remember how I gazed on the 5 oz. bottle 4 per cent. solution, and thought it contained a host of subtle devils, and liable to turn one of them loose on us in an unsuspected moment. It first worked very nicely, and I felt more gratitude than I could express. Next (a few days later) I persuaded a lady who dreaded pain with the use of this drug, "it would not hurt." She wanted the tooth out, and my word was taken as "tender." The truth is, the stuff had fermented, and was equivalent to that amount of common water. She gave me "hail Columbia!" saying, "I saw stars and Jerico," and that the sights were not sufficient atonement for such pain, and added, "If I were a man I'd break the third commandment—but she didn't—(audibly). A few days later I read of how carbolic acid should be used to prevent fermentation. In my next I tried that; now at this time it was very expensive, and taking into consideration the amount I had lost by fermentation, it was making "too much sugar for a cent." Well, carbolic acid was cheap, so I wanted to use a plenty, which I did. As a proof of this my next patient's gum sloughed considerably. It was simply shocking! Now I wanted to be alone I went back into my laboratory, and said to myself, I'll never use Cocaine again; and I'll teach my children to teach their children for ever let it alone. For more than a year I did not use it again. Finally I formed the acquaintance of a reputable surgeon who spoke in praise of Cocaine, and told me his simple method of using it, which has ever since been mine. I will try to give it clearly. I buy the salts as it is put up by Park, Davis & Co., in 5 gr. vial. Taking an instrument I stir the salts in the vial so that there will be no lumps adhering to the sides of the

bottle; then by guess I empty $\frac{1}{4}$ of the contents into another small vial, and add about ten drops of water. This I take in my hypodermic syringe, and carefully deposit on each side of the tooth to be extracted well under the mucous membrane, and as near to the root as I can get it with my needle. I always prepare it for the case in hand. In this way I can extract almost any tooth absolutely without pain, so that I am sure to receive the blessings of my patient. Ladies especially take care to slip in a nice word for me to their friends.

But just here we are on the dangerous ground. If we are careless and unintelligent in its application, we will find a feeble patient, and occasionally those we least expect, becoming dreadfully nauseated, and losing to some extent the control of their tongue; also the organs of prehension and deglutition. Others will complain of slight nausea, with abnormal pulsation, and an uncomfortable feeling in the region of the heart. Others will talk foolishly, or perhaps (if a lady) will shed tears and become very nervous. Others will complain of the loss of the use of their limbs, and will vehemently declare their inability to walk or stand or move in any way. And, in fact, carelessness will give us all sorts of trouble. I find no better stimulant where I suspect such a case than to give from one to two ozs. of brandy just before I begin. Even then they may complain of nausea. This can be avoided by administering a small amount, say one drop of the carbolic acid and cocaine, then waiting a minute before going on. After you have produced insensibility to the touch of the point of your lancet (which I always use) you need have no fears of causing any systemic disturbances by applying the $1\frac{1}{4}$ grs. to the next tooth to be extracted; if you wish to remove several teeth at one sitting, cocaine, unlike most remedies, will not accumulate in the system. I do not now wait five minutes for the effects. I proceed at once telling my patient not to complain until they are hurt.

Now a word about those who may have unconsciously used the drug a little too freely. We can always tell by the patient's facial expression when we are going to have trouble. Loosen the clothing, remove the tooth immediately, let in fresh air, and take hold of your patient, asking, and forcing them to stand up and walk about. Exercise is the thing. It always has worked like a charm for me. Often they will complain of a stiffness of their knees, and will want to sit or lie down. Don't permit it, but insist on a promenade, and, like most promenades, it will do you both good. To make the effects more durable, use atropia with the cocaine solution. This will often prevent the necessity of brandy or other stimulants.

THE

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THE DENTAL LABORATORY.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

(Continued from 43. No. 2. Vol. 3.)

CROWNS.

We propose now, to take up the subject of "Crowns," and to describe the process of making these from the simplest forms to those of a more complex nature.

For the crown which we will now describe, we proceed as follows: As a typical case, we will take *a central incisor*. The natural crown is nearly all destroyed by decay and the nerve dead. With a spoon excavator like Fig. 48, we remove all the loose decay until we reach the sound dentine. The work may be hastened by applying the dam over *the four front teeth*, especially if there is sufficient of the tooth left that we are to crown, to pass a ligature around so as to retain the dam in place. Once this is applied and the ligature tied *well up on the neck of the tooth* (or its remains), the treating of the root (if it need treatment), the sealing of the apical foramen, the enlarging of the nerve canal, and all the work connected with the operation may be carried on much more tidily, and with much greater dispatch than if done without the dam; besides, by tying the dam well up on the neck the gum seems to be pressed away to such an extent that often, nearly the whole operation can be performed with the dam in place.

Fig. 48.

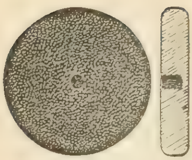

Fig. 49.

The apical foramen is sealed, and the hole for the pivot or dowel *partially made*, the remains of crown is dressed down with a stump corundum wheel like Fig. 49, or with a corundum point like Fig 50, these being kept wet (over the dam) with water dropped on with a pipet, or with a small piece of wet sponge. The root being cut down we proceed to complete the hole for the dowel. This may be done with fissure

Fig. 50.

burs of graduated sizes like Fig. 51, these instruments being used in the handpiece of the dental engine, and the increase in size being accomplished by using successively from a smaller to a larger tool; and the size being determined according to the root that is being worked on. The depth of the hole for the

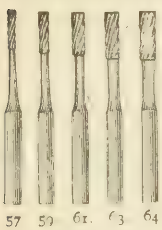

Fig. 51.

dowel need not be greater than the cut surfaces of these instruments; from a quarter to five-sixteenths of an inch deep. The hole being made, a piece of gold, or platinum and iridium wire is fitted into it. This should fit snugly but not tight. A good plan is to let about as much space as would be occupied by a thickness of writing paper between the outer surface of the dowel and the walls of the dowel hole.

We proceed next to make the face plate. We make this ordinarily of a piece of very thin platinum plate. We cut this oval, sufficiently large to cover the face of the root and we pierce it with the point of any sharp instrument. Fig. 52.

Holding this for an instant in the blaze of the spirit lamp, to warm it, we drop on it a small quantity of adhesive wax. We then warm the dowel and pass this, a little more than the eighth of an inch, through the hole *in* the face plate. The two pieces are then carried to the mouth of the patient and on and into the prepared root. About a quarter of an inch of the dowel is cut off below the face plate. It is then removed from the root. The part of the dowel

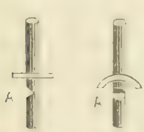

Fig. 53.

which is to be *in* the root, is seized with a pair of flat nose pliers, and the protruding end of the dowel is well nicked with a file on one side (say towards the front.) Fig. 53 A. The whole face of the face plate, where the dowel protrudes, (A) is now covered with more adhesive wax, and before this chills thoroughly, it is placed in and over the root, and the dowel pushed into the root as far as it will go. While it is held, with the fingers of the left hand, by the

Fig. 54.

protruding end, with burnishers like Fig. 54, in the right hand, the adhesive wax, on the face plate is pressed upon until a perfect fit of the face plate to the root is obtained. The reason we cover the face plate with adhesive wax is because this substance, before it gets hard, is perfectly dead in elastic and without the least spring, so that when it is manipulated as we have described, a perfect fit is obtainable. The dowel and face plate may now be removed from the root. A small bit of wax is placed on the glass slab in the laboratory, and the protruding part (A) placed into this piece of wax so that it will stand in the position on the slab, as shown in Fig. 53. It is now invested in plaster and sea sand, and while the investment is hardening a tooth may be selected, ground and fitted to the root, which can be very nicely done with the dam still in position. The tooth may be backed and gotten ready for the dowel and face plate when these are soldered.

The investment being now hard, the dowel is soldered to the face plate, after which it is boiled in acid to dissolve off the borax. The dowel and face plate may now be tried again on the root, and any little inaccuracies of fit corrected by pressing the face plate against the root with a burnisher.

Fig. 55.

Should it happen that the operation cannot be carried on to its completion, the dam may be removed from the teeth, the dowel and face plate put in position and a plaster impression taken of the parts. The little impression cups, Fig. 55, being admirably suited for impressions of such cases. At least one tooth on each side of the root that is to be crowned should be included in the impression. The nick which was cut on the protruding end of the dowel was made so that the plaster would enter it, and in removing the impression from the mouth the dowel and face plate would be brought away also. The impression is now painted with shellac varnish, and when this dries fine powdered soap stone or French Chalk is rubbed with a small camel hair pencil all over the impression, and all the surplus dusted away. A pin, with the head cut off, is stuck into the depression of each tooth of the impression, and a model is made. When the model is hard it is removed from the impression. The use of the powdered soap stone is for the purpose of producing a smooth surface to the model, as well as to aid in removing the impression from the model. The protruding end of the dowel is now seized with a pair of flat nose pliers and with a slight twisting motion

it is removed, with the face plate, from the model. The protruding end is now cut off, with the cutting nippers, close to the face plate, when the porcelain tooth may be ground, fitted and aligned in its proper position on the model. The tooth is then backed, and afterwards stuck to the face plate with adhesive wax. The adhesive wax is then chilled, when the tooth is removed from the model. It frequently happens that it is considerable trouble to remove the tooth, with the face plate and dowel from the model, without the risk of moving the tooth from its position or alignment, or without considerably marring the model by insinuating an instrument beneath the face plate in order to prize it out. We are indebted to Dr. W. H. TRUEMAN for the following suggestion, by which both these may be overcome. After the tooth has been gummed to the face plate with adhesive wax, the little model is turned over, and a conical hole cut into the base until the dowel is reached. A blunt pointed instrument is now pressed on the dowel, which pushes this and the tooth out, without danger of disturbing the position of the tooth or of mutilating the model. Fig. 56 explains better what we have attempted to describe. In the engraving the front part of the model has been cut away to show the conical hole, which was cut in the base of the model, in order to reach the end of the dowel. The end of the dowel is also shown.

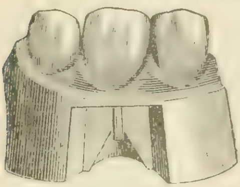

Fig. 56.

We desire to suggest a slight advantage to this plan. Often in cutting the conical hole at the bottom of the model, in order to reach the end of the dowel, considerable trouble is experienced before the end can be reached, as it is difficult to exactly locate it. When the plaster impression is removed from the mouth, with its adherent face plate and dowel, place on the end of the dowel a minute film of adhesive wax. Now take a piece of iron wire about $\frac{1}{2}$ inch long, file it flat on the end, and heating it slightly, put a film of adhesive wax on this. Apply this piece of iron wire to the end of the dowel in the impression so as to make, as it were, a continuation of the dowel; *then fill the impression.* When the model is made the piece of iron wire serves as a guide to direct you in your cutting in order to reach the end of the dowel.

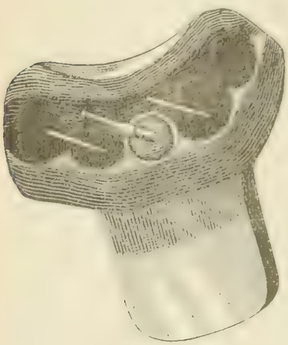

Fig. 56 A.

The tooth is then invested and afterward soldered, and then finished and polished ready for insertion. After the tooth is soldered, it will be found that the gold solder is *very hard to file up*, so that lately we have been using corundum wheels to do this finishing. It can be done much more expeditiously with corundum wheels on the lathe than with files, and much more economically, as corundum wheels are cheaper than files. The gold cut away by the corundum wheels need not be lost. A piece of paper may be placed over the bottom of the drip pan, and all the gold cut away in finishing falls, with the water on to it, after which the paper may be lifted out and dried and the gold thus saved.

If the case can be proceeded with without resorting to the trouble of taking an impression and making a model, as we have described, the dam (in many cases) need not be removed.

Indeed we may offer a suggestion by which a tooth may be entirely crowned (in many cases) and the root freely cut below (or above) the gum margin and yet have the great advantage of keeping the dam in position during the entire operation. When the case presents, wrap a piece of gilling twine or ligature silk around the root several times (from 3 to 5 times), pushing each lap well up on the neck of the remains of the tooth, until the gum is whitened, when it may be securely tied and the patient dismissed for a day. At the next appointment, on removing the ligature, the gum will be found absorbed or well pushed away from the neck of the tooth, so that the dam may be applied, and the parts easily operated on, without blood and with perfect dryness, which is of the greatest advantage in this kind of work. In cases where the whole crown of the tooth is consumed by decay, this, of course, cannot be done, but a very fair view of the root may be obtained as follows: Clean away as much of the decay from the face of the root as possible, and partially ream out the nerve canal. Wipe dry, and place in the canal a little spicula of red gutta-percha; build around the head of a gimp tack a pellet of red gutta-percha about the size of a buckshot, heat this as well as the point of the tack and press it quickly into the root. Manipulate the gutta-percha with a large ball burnisher all over the face of the root so as to force it all over the conical margins of the root. When the case presents for crowning, at the next appointment, the root will be in much better condition to work on than if this preliminary had not been taken. The protruding end of the dowel, above the face plate, may be cut off close. The porcelain tooth being backed with gold, is fitted to the root when it is stuck to the face plate with adhesive wax and properly aligned. The dam may now be removed so that the

lower tooth can be brought in antagonism to ascertain the proper articulation. The tooth may then be invested, soldered and finished, as has already been described. Although not connected with *laboratory work* we will describe the insertion of such a tooth as we have been constructing. When the tooth is finished, the dowel is well scored as shown in Fig. 57—A. It is then seized carefully with a pair of straight incisor forceps as shown at "B" Fig. 57, when it is passed to and fro through the blaze of a spirit lamp until the tooth and dowel are thoroughly heated. Some white

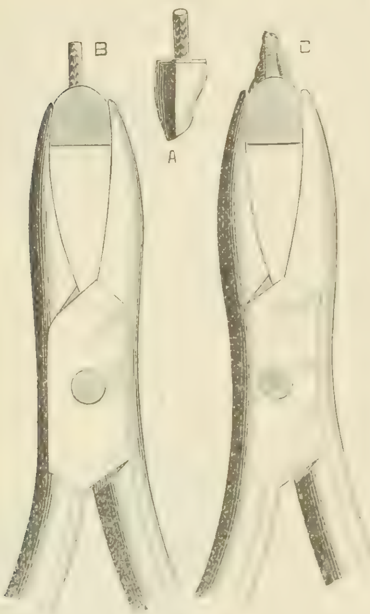

Fig. 57.

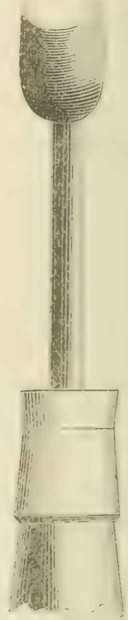

Fig. 59.

gutta-percha, which softens at a low heat, is now placed all over the dowel and face plate to which it adheres tenaciously and built up into a cone, as shown at "C" Fig. 57. While the gutta-percha is still soft the dowel is passed into the root and pressed into place, the surplus of gutta-percha oozing out over the front, back and sides of the face plate. Before the gutta-percha gets perfectly hard, the crown is carefully removed and the surplus carefully cut off. With a wheel bur, in the dental engine, a groove is cut within the hole of the

Fig. 58.

root, as shown in Fig. 58— A. The crown is again heated as before described by passing through the blaze of the spirit lamp, and the *least bit* of gutta-percha added to the dowel. The lips of the patient are protected with a napkin, and the hole in the root *thoroughly dried*. The instrument Fig. 59 (which is only a piece of brass, hard soldered to a shank of brass wire, and mounted into a wooden handle the size of the cut), is heated hot in the blaze of the spirit lamp, and while the tooth is kept warm and the gutta-percha soft, the dowel is entered into the root, when the forceps are laid aside and the instrument Fig. 59, is taken and placed over the porcelain tooth, when it is gradually and steadily carried to its proper position. The heat of the instrument serves to keep the gutta-percha soft and this insinuates itself into the groove cut into the root shown at "A" Fig. 58. The hot instrument may now be removed and the tooth held in its position until the gutta-percha hardens, when the operation is complete. For a crown constructed on this principle, not over two hours should be consumed. To insert "a ferrule" or Richmond crown which we will describe, more time is necessary.

THE FERRULE CROWN.

Strictly speaking, the preparation of the root for the insertion of crowns does not come under the head of laboratory work: yet to give a description of this may be acceptable to our readers.

Fig. 60.

For fitting a ferrule around a root, the root must be stripped of the remains of enamel, which lies just under the free margin of the gum. To do this the root should be dressed down with the stump corundum wheel in the dental engine. A strong steel instrument tempered very hard and having its end or point bent at nearly right angles and sharpened to a point, like a scaler (which any dentist can make for himself), will do this part of the work. Fig. 60 shows the instrument. The instrument is used in the right hand. With the thumb resting firmly and steadily on some contagious tooth, the point is passed beneath the free margin of the gum, where it catches the enamel. A steady pull strips it from the root, or powders it, so that by continued use of the instrument in this way the enamel is removed, and such a bevel or parallel given to the end of the root as to enable the dentist to fit the ferrule accurately. The size of the root is taken by passing a piece of binding wire around it and twisting the free ends with a pair of flat nose pliers, until the wire hugs the end of the root closely. The wire is then removed, and

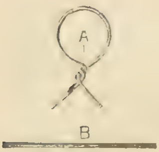

Fig. 61.

it is cut at the twisted part A, Fig. 61. This is then straightened out as at B, Fig 61, when it is laid on a piece of pure gold plate, 1-16 of an inch wide, and about 30 thick. It is cut about 1-16 of an inch longer than the twisted wire gauge as shown at B, Fig. 61. The two ends are chamfered to a feather edge, so that when the lap is made there will be no more bulk at the lapped ends than at any other part of the ferrule. The lapped ends are then soldered, the ends being retained next each other by means of a small iron wire clamp shown at Fig. 33 of these papers.

A very good plan has been suggested to make the ferrule of a Richmond crown—or an all gold crown, as follows:

When the wire has been twisted around the prepared root as shown at Fig. 61, and carefully removed, it is laid on a piece of straight,

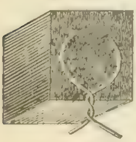

Fig. 62.

close grained wood, as shown at Fig. 62. With a well directed blow of a hammer, this is driven into the wood which leaves it embeded. The wire is now removed, and the wood whittled and filed down to the mark left into it by the wire, which is the exact size and shape of the root. Around this pattern of the root the ferrule may be bent, which if carefully done will exactly fit the root.

As it is sometimes quite difficult to convey the heat just at the point where it is wanted—without overheating the metal at a part where heat is not wanted, thereby often causing the solder to daub the band, or refuse to flow at the point where union of the parts is necessary—a special device to meet such cases is needed, and will be here described, before proceeding farther with the subject of the ferrule crown.

Take a piece of sheet-iron and cut it into the shape shown at Fig 8 of these papers. This should be about 4 inches square. The ends 1, 2, 3, 4 should be bent up so as to form it into a box, and a hole punched in the centre. A large headed tack or nail may be driven through the hole into a handle. Equal parts of Plaster of Paris, Powdered Kaolin Clay and Powdered Asbestes are well mixed together by grinding in a mortar, when they are moistened with water to a doughy consistency and put into the box. While the mass is

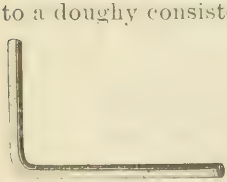

Fig. 63.

still soft, a round 8 ounce weight is pressed into it, so as to make a depression, and two pieces of iron wire being bent like that shown at Fig. 63 are pressed into the mass, when it is laid aside to dry and harden. We are indebted to Dr. Hall for the proper proportions, as well

as for the ingredients for making this kind of soldering device. The soldering appliance thus described is shown at Fig. 64. With this appliance, a ferrule, a metal crown, the cap or cover for a ferrule, and very many other small objects, used for crown work, or regulating appliances, may be laid on the pieces of iron wire, (which can be brought close together or separated wide apart) and there soldered, with the advantage of being able to apply the heat just where it is needed.

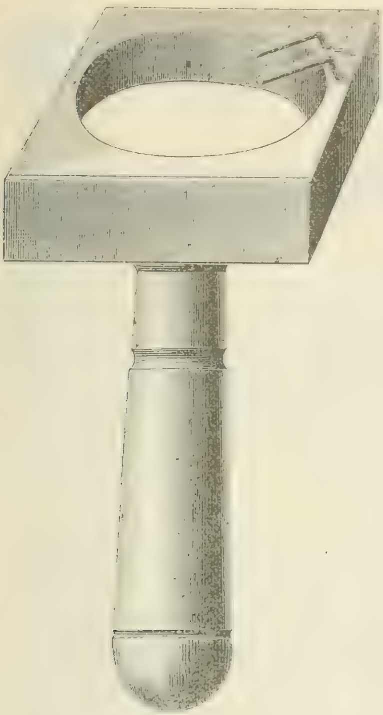

Fig. 64.

Another very easy and expeditious way of making a ferrule is as follows:—Take a piece of pure gold No. 30 thick and 1-16 of an inch wide and about an inch or an inch and a quarter long, bend this around the round handle of an excavator, as shown at Fig. 65, A. Place it around the root and squeeze the ends tight with a pair of flat nose pliers until it fits the root snugly at every part. Abandon the larger flat nose pliers and seize it again with a delicate pair, and remove it carefully from the root. Paint the junction of the two ends (still held immovably with the pliers) with borax, blow a blast on it until the water of crystallization has passed out of the borax, and then place a minute piece of gold solder (about the size of a pin's head) at the junction and fuse it. This will give you a ferrule as shown at B, Fig. 65. In bending this the two ends were seized at the *labial* surface of the root. The ferrule is now placed over the root again so that the ends will be at the *palatal* surface, which is readily done by a little manipulation with a burnisher. When it is made to fit in its new position it is carefully removed. The parts of the ferrule which pass on the root proximate to the adjoining teeth are now filed out or festooned so as to conform to the gum margin. This may be done either with a fine file or with the cutting nippers. Fig. 66, as shown at Fig. 67. The other part of the ferrule is filed like

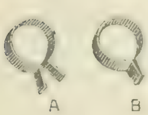

Fig. 65.

a gable roof. A piece of pure gold of similar thickness is bent like

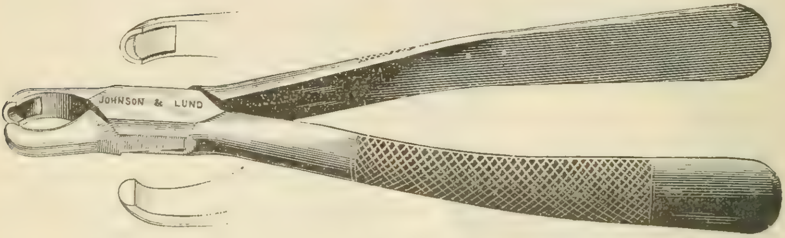

Fig. 66.

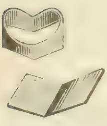

Fig. 67.

Fig 68.

a gable roof A, Fig. 67. This is painted on its concave side with powdered borax and water, firmly ground to a creamy consistency, and the ferrule laid into it. The two are held together by *very fine binding wire*, Fig. 68, when it may be laid on the wires of the soldering appliance, Fig. 64, and united by solder. The overlapping edges of Fig. 68 serve as ledges on which to place the pieces of solder. When soldered these ledges are filed flush with the sides of the ferrules, and should the plan for making the ferrule, as shown at A and B, Fig. 65, be adopted, the protruding end is likewise filed off close to the ferrule. Before replacing this on the root, a hole is punched in the cap or gable for the accommodation of the dowel. This hole may be increased to the proper size for the dowel, either with five sided taper broaches, or it may be placed on the root (after the hole is punched) and the hole brought to the exact size with a sugar loaf shaped *fine cut* burs, Fig. 69 in the dental engine. The dowel is now fitted to the root and a little adhesive wax placed on the gable. The dowel is warmed and passed through the hole, when a little more adhesive wax is put on, and a protruding end of the dowel of about 3-16 of an inch left above the gable. It is then carried to the mouth while the wax is still pliable and all put in proper position. The wax is then thoroughly chilled, when it is carefully removed from the root, invested and soldered..

243. 245. 246.

Fig. 69.

If the work cannot be carried to completion, the protruding end of the dowel, above the gable, is deeply nicked with a file and an impression taken with the ferrule on the root. It may be well here to remark, that before filling the impression thus taken, that the inner part of the ferrule should be carefully filled with wax *nearly* up to its edges, Fig. 56, A. If this precaution be not observed before filling

the impression, the plaster will flow into ferrule, and in attempting to remove it, when the impression is cut away from the model, all the plaster within the ferrule will be broken away and there will not be that certainty as when the above recommendation is observed. The ferrule is now removed from the model and the protruding end of the dowel cut off as shown at Fig. 70. A tooth is backed and ground to fit the gable or cap of the ferrule. It is united to it with adhesive wax removed from the model invested, soldered and finished, as shown at Fig. 71. The insertion of a ferrule crown is accomplished in the same way as indicated for the other, or it may be inserted by the use of phosphate of zinc cement instead of gutta-percha— the latter, however, is always to be preferred, for in the event of the porcelain face breaking, there will be considerable trouble in removing the dowel from the root when phosphate of zinc cement is used.

Fig 70.

Fig. 71.

(*To be continued.*)

METALLIC MODELS FOR RUBBER AND CELLULOID WORK.

By T. M. Allen, D. D. S., Birmingham, Ala.

I hear a great deal of complaint from dentists about the shrinkage of rubber vulcanizing, and also about the palatine surface of plates being rough and irritating the gums. I have had some trouble from the same cause, and to overcome this I have adopted metallic models and I find that I succeed better, and the plate comes out of the vulcanizer with a hard, smooth polished palatine surface, and where gum teeth are used there is no shrinkage in cooling and no broken blocks. My method of making metallic models is as follows: (I use plaster exclusively for impressions.) After taking the impression in plaster I put over it a very thin sheet of base plate wax, pressing it down in the alveolar ridge depressions with wax knife or finger, or warm the wax and replace the impression in the mouth, pressing it up good, then remove from mouth (be sure to get your impression high up on the alveolar borders); trim the wax around the edges of the impression a little higher than you will want your rubber plate to come up on the alveolar ridge, then oil exposed parts of plaster impression and fill over wax and all, as though you were to make a plaster model. When hard, separate impression and model, being careful not to break or mar impression, remove wax and cut two or three shallow grooves in the model, from heel of plate to near the edge of alveolar border,

cutting vents for pouring metal and for escape of steam at heel of plate; then replace model and fasten it to impression with wire or clamp, and dry impression and model by dry heat, and while hot, melt metal for making model and pour into gate at heel of impression. When cold, separate from impression and you will have a thin metallic coating over your plaster model; you then proceed as with an all-plaster model. The metallic coating over the plaster model gives it strength to resist pressure in closing flask, and also overcomes the warping or shrinking tendencies of the rubber. After vulcanizing, remove plaster from metallic coating, and with a pair of pliers or other suitable instrument bend down the alveolar edge of metal and you can separate the metal from the plate without any trouble, and will have a hard, smooth-polished palatine surface that will not irritate the mucous membrane, and is much easier to keep clean. There is no danger of breaking down your model in closing the flasks, no matter how deep your undercuts may be; and as there is no giving way of the metal coating your plate cannot warp, shrink, or crawl from over the condyles as when plaster models are used. The advantage in making the metallic model this way is, that you only have a thin coating of metal, and you can easily get it out of the plate; whereas, if you had made it all metal you could not separate it without injury to the plate. The metal used can be Babbitt metal, block tin, or tinners solder. I prefer the two latter as they do not tarnish by the action of the rubber and plaster in vulcanizing. Never use lead, as it oxidizes and blackens the rubber.

I use a metal that I prepare especially for the purpose, that melts at a low temperature, flows easily and smoothly, and makes a sharp impression. This metal can be used over and over indefinitely. It does not oxidize the surfaces of plates in contact with it, and it comes out with a polished surface.

After vulcanizing, the flasks should be taken out of the vulcanizer as soon as possible, cooled off and opened, or set away to cool. If left in the vulcanizer the plaster becomes soft and mushy in cooling, and allows the plate to warp or shrink, but when taken out of the vulcanizer and left to cool off, the plaster remains hard and resists any tendency in this direction.—*Archives of Dentistry.*

PASSED THE POOL BILL.

THE MISSOURI SENATE OPPOSED TO TRUSTS AND COMBINES.

A Full Text of the Measure Which Now Goes to the Governor for His Signature—The Laundry Inspection Bill Defeated.

JEFFERSON CITY, May 4.— The House anti-trust and pool bill, which is of great importance to the people of the State, passed the Senate this morning and it has now gone to the Governor for his signature. The bill was written by Mr. Allison, the Democratic member from Ralls county, and was introduced in the House as a substitute for 13 other bills on the same subject, introduced by as many different members from all parts of the State. Part of a bill introduced by Mr. Thompson, the Democratic member from Macon county, was incorporated in the bill by Mr. Allison. The evils that have grown out of trusts within the last few years can be crushed out if the new law is enforced. That people generally may understand the provisions of the new law, it is given in full, as follows:

An act entitled, an act for the punishment of pools, trusts and conspiracies, and as to evidence in such cases.

Be it enacted by the General Assembly of the State of Missouri, as follows:

SECTION 1. If any corporation, organized under the laws of this or any other State or country, for transacting or conducting any kind of business in this State, or any partnership or individual or other association of persons whosoever, shall create, enter into, become a member of or a party to any pool, trust, agreement, combination, confederation or understanding with any other corporation, partnership, individual or any other person or association of persons, to regulate or fix the price of any article of merchandise or commodity, or shall enter into, become a member of or a party to any pool, agreement, contract, combination or confederation to fix or limit the amount or quantity of any article, commodity or merchandise to be manufactured, mined, produced or sold in this State, shall be deemed and adjudged guilty of a conspiracy to defraud, and be subject to indictment and punishment as provided in this act.

SECTION 2. It shall not be lawful for any corporation to issue or to own trust certificates, or for any corporation, agent, officer or employes, or the directors or stockholders of any corporation, to enter into any combination, contract or agreement with any person or persons, corporation or corporations, or with any stockholder or

director thereof, the purpose or effect of which combination, contract or agreement shall be to place the management or control of such combination or combinations, or the manufactured product thereof, in the hands of any trustee or trustees, with the intent to limit or fix the price or lessen the production and sale of any article of commerce, use or consumption, or to prevent, restrict or diminish the manufacture or the output of any such article.

SECTION 3. If a corporation or a company, firm or association, shall be found guilty of a violation of this act, it shall be punished by a fine of not less than 1 per cent. of the capital stock of such corporation or amount invested in such company, firm or association, and not to exceed 20 per cent. of such capital stock or amount invested. Any president, manager, director or other officer or agent or receiver of any corporation, company, firm or association, or any individual, found guilty of a violation of the first section of this act, shall be punished by a fine of not less than $500 nor to exceed $5,000, and in addition thereto may be imprisoned in the county jail not to exceed one year.

SECTION 4. Any contract or agreement in violation of any provision of the preceding sections of this act shall be absolutely void.

SECTION 5. Any purchaser or any article or commodity from any individual, company or corporation transacting business contrary to any provision of the preceding sections of this act shall not be liable for the price or payment of such article of commodity and may plead this act as a defence to any suit for such price or payment.

SECTION 6. Any corporation created or organized by or under the laws of this State which shall violate any provision of the preceding sections of this act shall thereby forfeit its operate right and franchises, and its corporate existence shall thereby cease and determine; and it shall be the duty of the Secretary of State, after the passage of this act, to address to the president, secretary or treasurer of each incorporated company doing business in this State, a letter of inquiry as to whether the said incorporation has merged all or any part of its business or interest in or with any trust, combination or association of persons or stockholders as named in the preceding provisions of this act, and to require an answer, under oath, of the president, secretary, treasurer or any director of said company; a form of affidavit prescribed by the Secretary of State, shall be enclosed in said letter of inquiry, and on refusal to make oath in answer to said inquiry, the Secretary of State shall immediately revoke the charter of said company, and make publication of such revocation in four newspapers of general circulation in the four largest cities of the State.

Section 7. It shall be the duty of the Secretary of State, upon satisfactory evidence that any company or association of persons duly incorporated and operating under the laws of this State have entered into any trust, combination or association as provided in the preceding provisions of this act, to give notice to such corporation that unless they withdraw from and sever all business connection with said trust, combination or association, their charter will be revoked at the expiration of 30 days from date of such notice.

Section 8. It shall be the duty of the prosecuting attorneys in their respective jurisdictions and the Attorney-General to enforce the foregoing provisions of this act, and any prosecuting attorney or the Attorney-General securing a conviction under the provisions of this act shall be entitled, in addition to such fee or salary as by law he is allowed for such prosecution to one-fifth of the fine recovered. When the Attorney-General and prosecuting attorney act in conjunction in the prosecution of any case under the provisions of this act, they shall be entitled to one-fourth of the fine recovered, which they shall divide equally between them where there is no agreement to the contrary.

Section 9. Whereas, great injustice is being done the people of this State by the formation of trusts and trust companies; therefore, an emergency exists, and this act shall take effect and be in force from and after its passage.—*The Cincinnati Medical Journal.*

Combinations. Our readers, especially the Dentists, know what our opinion is in regard to Dental Dealers Combinations and in fact all other combinations and trusts. We publish the above bill, recently passed in Missouri, to which we call especial attention. We are glad to see that trusts and combinations are becoming more and more unpopular. We expect to hear from other States and will keep our readers posted as the work advances.

Publishers.

EDITORIAL.

PATENTS AND ETHICS.

The subject of patenting or of not patenting dental appliances in Dentistry has lately raised a storm of opinions "pro and con," especially since the reading of an article by Professor Horatio C. Meriam, D. M. D., of Harvard University Dental School, entitled "Professional Atmosphere and Morals: or, Patents and Secrets *vs.* A

Liberal Profession" before the New York Odontological Society in March last, and published, with the discussion, in the Dental *Cosmos* for June, 1889.

It is useless to endeavor to force men's opinions by *flimsy Ethical talk*, when *substantial, reasonable facts* are confronted with them. There are too many eminent men patentees in the ranks of the dental profession, men who are too highly esteemed by all members and classes of the community, to endeavor to ostracize, or stigmatize as illiberal, because they have patented their inventions; labor which doubtless has cost them years of thought and doubtless lots of money. We hear constantly the truism of "Labor Omnia Vincit," but who hears that "Ethics conquer all?"

Medical men are as fair minded and reasonable as other men, and we do not believe that there is one within the ranks of that profession, certainly not one whose good will or opinion is worth having, who would look down on the man, who by his inventive faculty could aid him or facilitate him in his work, or would sneer at him because he is a patentee. No, we believe he would sooner take him to his heart and bless him, not alone for the help he has given him as an operator, but for the benefit he has conferred on his calling.

There are as many noble and honorable men who are patentees, as there are others—misguided or not sufficiently thoughtful we must believe—who talk this specious talk, of resigning the labor of years, the thoughts of many a sleepless night, perhaps the outlay of no inconsiderable amount of money, because of a "Will o' the Whisp" idea. Is it reasonable, is it fair, is it just to ask a man to do this? Will good men think better of them for it? Would they benefit the world by such a course? Do medical men, whom they ask us to emulate, or who are held up to us as examples, act thus themselves? True, these give freely and generously, when any discovery of theirs tends to the amelioration of human suffering; but these discoveries are more frequently the result of inspiration than the acts of long labor or studious thought. But if they write a book, in which their thoughts are expressed—a book which has cost them time, labor, anxiety and money; do they hesitate to "Copyright" it? Do their confreres taboo them for this? What is the difference between copyrighting a book, or patenting an invention? Dentists (except some who are unworthy the name of humanitarians) have acted in like manner. They have given freely and generously when it was a question of *saving pain* to their patients, or to humanity; but when it was a question of *saving trouble* to their confreres, then the idea assumed another aspect. Has the administration of N. O. gas for the painless

extraction of teeth ever been patented? Was the discovery of the painless devitalizing of the nerve by arsenic ever patented or kept secret? Has the discovery of any thing tending to the saving of suffering ever been held a secret or patented by any man whether dentist or physician? We do not know of any such. Why then advise us to be subservient to the medical profession for the sake of gaining their recognition, when they themselves do not act differently themselves. The sooner we throw these silly foibles of Ethics overboard, the better will it be for us as a profession. Let us act fairly, squarely, fearlessly, openly and conscientiously, and medical recognition, if essential, or if we must have it, will come to us of its own accord soon enough, and better than by seeking to gain it by pandering to the whims of a few.

"The Surgeon is a specialist—although few confine themselves to a practice purely surgical, except in cities and hospitals—Richerand correctly defined the specialism of surgical therapeutics as the "*quad in therapeia mechanicism*;" its well known etymology conveys the same idea, (the healing by manual operation.) Yet the element of mechanism and necessity for the exercise of "hand craft" enter more or less, into all physical sciences. Astronomy, chemistry, pharmacy, microscopic analysis and modern medical diagnosis demand extreme accuracy of manipulation; and all great discoverers in these sciences display the ability, not only to use, but also to invent and construct apparatus. The universal recognition of the great value of this element in every department of Physics has given the scientific world a more correct idea of the true dignity of highly-educated mechanical skill—skill, without which, the physician's art is crippled, surgery becomes impotent and dentistry has no existence."

Among the many dentists who have patented appliances, there is probably no one so inventive as Dr. Bonwill—and no one we may say so liberal—in resigning the claims to which he was justly entitled. Thus we record some of the free gifts of Dr. Bonwill to his profession as also to general surgery:

1st. The application of Electricity of both the direct and "to and fro" current for the painless removal of living pulps, and the excavation of sensitive dentine.

2nd. The Anatomical Articulator, invented in 1854, and given to Dr. McQuillen to present to the profession at the Niagara Falls meeting, about 1858 or 1860.

3rd. The first practical and scientific method of pivoting teeth over the old wooden pivot which was offered in 1873 and published in the proceedings of the Odontological Society of New York, in March,

1877. This was the basal ground work of first placing a pin secured in a root, and placing a crown of any kind by a screw or cement afterwards; and the profession in this have a chance against all claimants since.

4th. The shellac and corundum disks (better known as Arthur's disks), which we have heard Dr. Bonwill say he has Dr. Arthur's letter to show for it. Also the hard rubber and corundum disks, as well as the small corundum and shellac wheels and points, for use in the dental engine, known as Dr. Northrop's forms.

5th. The first Right Angle Attachment for the dental engine which he made in 1872, of which he still has the models and which he gave to the profession.

6th. He gave the first instrument for holding disks at an angle, but which device was afterwards patented by Dr. Hickman of Reading, Pa.

7th. He demonstrated the invaluable fact, as far back as 1870, that Abbey's old fashioned gold foil could be made into a solid mass, the same as adhesive gold foil, when done with the electric mallet and smooth points.

8th. He freely gave to all the discovery of the air as an anæsthetic in minor surgery, for the obtunding of pain, both in excavating sensitive dentine, and in the extraction of teeth. This discovery of anæsthesia by rapid breathing having been recognized by men of repute all over the world, and we have heard Dr. Bonwill say that Brown-Sequard told him he was justly entitled to the discovery, and that he (Dr. Bonwill) having used it exclusively for extracting teeth for the past twelve years.

9th. The discovery that amalgam could be packed under Japanese bibulous paper and make the result infinitely better. The discovery being equal in importance to the discovery of the adhesive property of gold foil. Prof. Charles Ternes having said "he would have crossed the ocean to have seen this one thing demonstrated" and which he afterwards published as the best method of using amalgam ever invented.

10th. The discovery that smooth points would pack soft gold as well as adhesive gold, as far back as 1870 on the advent of the Electric Mallet, demonstrates as an old thing, that which Dr. Herbst—without knowing that it was demonstrated—endeavored to show as a new thing with his rotary principle of filling teeth.

11th. The Common Sense Tooth Brush was given to the profession in 1885 through the Odontological Society of Pennsylvania.

12th. The devices for reducing the size of Nerve Broaches without removing the spring temper of the same—making the taper even and regular, and the attenuation smaller than they could possibly be made by hand, from either Stubbs' steel wire or piano wire—was a free gift through the same society.

13th. A new clamp and matrix combined, to apply from the buccal and palatal sides, and made easy of removal without disturbing the gold or amalgam filling inserted. This was a new departure in this line. The pivot can be made of any metal or of hard rubber. It was given about two years ago at the same time that Dr. Woodward demonstrated his matrices before the Odontological Society of Pennsylvania.

These are some of the gifts of Dr. Bonwill whom we cite as one among many. Surely he has not been niggardly either to his own profession or to general surgery. Is it fair to expect him to give all of his inventions away? Would any reasonable and fair minded man expect it or ask it? He has patented

The Electro Magnetic Mallet,
The Mechanical Mallet,
The Dental Engine,
The Surgical Engine,
The Right Angle Pluggers,
The Porcelain Tooth Crown,

and we believe a device like the dental engine by which the labor of carving stone is greatly facilitated.

At the last meeting of the Odontological Society of Pennsylvania Dr. Bonwill said that such high authority as Prof. Hasley, of London, England, whose specialty is the difficult diagnosis, and still more difficult operation of the removal of tumors from the base of the brain, was eulogistic in his remarks of him at the late International Medical Congress in Washington, and acknowledged his great indebtedness to him whenever he performed one of these operations by the aid of his surgical engine. And not satisfied with this public avowal, he called on him at his house, before he returned to England, to personally thank him for the great boom his invention was to surgeons. Prof. Gross before his death, and his son after him, scarcely ever operated without the assistance of Dr. Bonwill, and were voluble in their praise of his invention and of him.

Would men like these, teachers among teachers refuse recognition, or look down with disdain on any man who by his inventive skill aided them so much in their work, simply because he was a patentee? We cannot believe in such narrowmindedness.

We incline to the belief that Prof. Meriam has taken a rather exalted view of the subject of patents, and in his desire to obtain medical recognition has permitted Justice to run away with Reason. We do not gainsay, yet we can scarcely believe that the cases he cites are but very rare or very extreme or very isolated ones. We cannot imagine that any patentee would resort to such extreme measures for the satisfaction of his claims, or that if the law gave him the right to examine the books of an infringer he would avail himself of it to further his ends.

We are therefore opposed to gaining medical recognition if it is to be gained by subserviency, or by the resigning of those just rights to which every man is entitled, and which we feel assured all just men recognize.

To try to gull the public by advertisements, setting forth that you have modes of practice superior to others; to resort to humbug, and quackery—these are the things that call for ostracism, and non-recognition both by the dentist and by the physician; and these are the things, more than "patents," that stigmatize and expel.

THE DOMINION JOURNAL.

This dental record seems to have life and vim, and we hail it as a worthy contemporary. It is issued monthly and the next number will appear about the middle of July—long before our present issue. The table of contents offer a good repast for thought and beneficial reading. Ed.

BRAND'S POPULAR ANTIQUITIES.

Vol. II. 475.

In Sinclairs Statistical History of Scotland, under the head of "Population:" "A few years ago a man died just above ninety who eight months before his death got a complete set of new teeth," &c

Artificial Teeth. According to Ames "There is in Ashmolis Museum a copy of Blagraves' Mathematical Jewel (*1585*,) in which, among other things concerning the author, that his nephew Sir John Blagrave who caused his teeth to be all drawn out and afterwards had a set of ivory teeth in again."

In a common place, written by one Thomas Rawlins, of Pophills, between 1724–34— "There lives in Belfast, Ireland, 1731, one Jane Hooks, 112 years of age, has her memory and appetite as well as when she was but twenty and has got a new set of teeth, which has drove out the old stumps."

Robert Lion, of ye city of Glasgow, aged 109, who was in the service of Charles I, got a new set of teeth and recovered his sight in a wonderful manner.

Mrs. Page at ye Royal Oak, Barnaby Street, Southwark, aged 90 years and upwards has lately bred six great teeth in ye upper jaw in June, 1732, which is an extraordinary and preternatural instance. She had not a tooth in her head for the past twenty years.

Margaret White, of Kirkcaldy in Scotland, aged 87, who had been toothless for many years, has just got eight new teeth. April, 1732.—*Contributed by Dr. Ambler Tees.*

A MANY-GIFTED "TEACHER."

The following advertisement appeared in *Parker's London News* of January 28, 1722 :—"James Williams, parish clerk, sexton, town crier, and bellman, makes and sells all sorts of haber-dashery, groceries, &c., likewise hair and wigs dress'd and out on the shortest notice. N. B.—I keep an evening school, where I teach at reasonable rates, reading, riting, and arithmetic, and singing. N. B.—I play the hooboy occasionally if wanted. N. B.—My shop is next, where I bleed, draw teeth, and shoe horses with the greatest scil. N. B.—Children taut to dance, if agreeable at sixpence per week, by me J. Williams, who buy and sell old iron and ceats. Boots and shoes cleaned and mended. N. B.—A hat and pair of stockens to be cudgelled for the best in five, on Shrof Tushday. For particulars encuire within at the Horse-shoe and Bell, near the church, on t'other side of the way. N. B.—I sells good ayle and sometimes cyder. Lodgings for single men. N. B.—I teach jografy, algebry, and them outlandish kind of things. A ball on Wednesdays and Fridays." Quite a walking encyclopaedia this J. Williams, for variety of information.—*The Journal of the British Dental Association.*

PAMPHLETS RECEIVED.

Report of the Jacksonville Auxiliary Sanitary Association of Jacksonville, Florida,—covering the work of the Association during the yellow fever epidemic of 1888. Edited by Charles S. Adams. Published under the supervision of the Executive Committee of the Association.

This pamphlet of over 304 pages gives a very complete history of the dreadful scourge which visited "the land of Flowers" last year, and the committees in charge of the various duties assigned them fulfilled their task to the letter. The cronological summary, is very complete,

and the record of the Finance Committee reflect great credit on the manner of its disbursements, and the order which it maintained in the long hours, days, weeks and months of its sessions, when there was so much to dishearten, sadden and to produce disorder and discord. It contains a very exhaustive exhibit on Relief, Sanitation, Nurses, Conference, Claims, Camp Refuge, Quarantine, &c., &c., together with a very complete showing of the Cash Donations, exhibited alphabetically by States of all the money received to aid the grief stricken State in her hour of tribulation.

We have received the following circular letter from the "Census Office" of Washington, D. C., and gladly give it space. Though addressed "to the Medical Profession" the object is one which should interest all who would have the statistics of the census as complete as they may be made.

DEPARTMENT OF THE INTERIOR,

Census Office,

Washington, D. C., May 1, 1889.

To The Medical Profession:

The various medical associations and the medical profession will be glad to learn that Dr. John S. Billings, Surgeon U. S. Army, has consented to take charge of the Report on the Mortality and Vital Statistics of the United States as returned by the Eleventh Census.

As the United States has no system of registration of vital statistics, such as is relied upon by other civilized nations for the purpose of ascertaining the actual movement of population, our census affords the only opportunity of obtaining near an approximate estimate of the birth and death rates of much the larger part of the country, which is entirely unprovided with any satisfactory system of State and municipal registration.

In view of this, the Census Office, during the month of May this year, will issue to the medical profession throughout the country "Physician's Registers" for the purpose of obtaining more accurate returns of deaths than it is possible for the enumerators to make. It is earnestly hoped that physicians in every part of the country will co-operate with the Census Office in this important work. The record should be kept from June 1, 1889, to May 31, 1890. Nearly 26,000 of these registration books were filled up and returned to the office in 1880, and nearly all of them used for statistical purposes. It is hoped that double this number will be obtained for the Eleventh Census.

Physicians not receiving Registers can obtain them by sending their names and addresses to the Census Office, and, with the Register, an official envelope which requires no stamp will be provided for their return to Washington.

If all medical and surgical practitioners throughout the country will lend their aid, the mortality and vital statistics of the Eleventh Census will be more comprehensive and complete than they have ever been. Every physician should take a personal pride in having this report as full and accurate as it is possible to make it.

It is hereby promised that all information obtained through this source shall be held strictly confidential.

ROBERT L. PORTER,

Superintendent of Census.

THE PRACTICAL PLACE.

A QUICK AND EASY WAY OF CONVERTING THE ORDINARY LOGAN CROWN INTO A BAND CROWN.

DR. E. L. TOWNSEND, LOS ANGELES, CAL.

Prepare root as is usual for the Logan crown. Adjust crown so that it articulates properly. Measure root with fine wire. Cut band so that it *fits*. Solder and burnish down on root.

Shape a plug of wood to correspond to size of Logan pin. Place in root cavity, and fill space between band and plug with modeling compound: chill and remove band plug intact. Melt fusible metal by holding over annealing lamp with a pair of pliers; when melted place band over socket, allowing wooden plug to enter socket: cool and remove modeling compound and plug: this gives a tight grasp on lower end of band, and does not allow it to change its shape. While fitting the crown into it, place the Logan or Brown crown in the band, allowing the pin to enter the socket: drive down till the porcelain comes in contact with the metal. In this way you stretch the gold around the porcelain; now burnish down tightly. If carefully performed the articulation should be the same as before the band was put on.

This is the strongest way a crown can be set, being a combination of dowel and ferrule. It need not show much gold. It saves time and money to the operator. Thirty minutes is ample time to fit the band, and fit the porcelain to it.

You do not need to leave the operating room. 18k. S. S. W. solder will flow by holding the band over an ordinary annealing lamp with a pair of pliers grasping the twisted ends of the binding wire.

Use nothing heavier than No. 30 plate for bands—No. 32 S. S. W. crown metal is just the thing.—*Western Dental Journal.*

PHENOL CAMPHOR.

Phenol Camphor, which has lately been employed in the treatment of wounds, is prepared by dissolving three parts of camphor in one part of carbolic acid. This produces a rather thin, clear, yellowish liquid, with a strongly camphorous taste and smell, which mixes readily with fatty, alcoholic, and ethereal liquids, and easily dissolves cocaine, salicylic acid, iodoform, and other bodies. Phenol camphor prevents suppuration; it combines the cooling effects of camphor with the antiseptic properties of carbolic acid, and, unlike the latter, is painless in its action, and does not show acid properties.—*Ztsch. Apoth. Ver.*

LOCAL ANESTHETIC.

Thoroughly dissolve twenty grains of cocaine in one ounce of ether (concentrated), and add one ounce of pure oil of peppermint; shake well before using. I have tried this preparation for about two years and find it gives better satisfaction than any thing else I have used. In fact, for extracting sore teeth and fangs, where the inflammation is so great as to partially loosen them, I find it almost entirely does away with the pain, when applied from six to twelve minutes.—*Dr. G. S. Staples, in Archives.*

A BATCH OF HINTS.

BY R. D. IN "DOMINION JOURNAL."

You invite hints in brevity as well as more studied articles; and I believe there is not a dentist living but could send you an original batch several times a year.

Taking a Bite.—Trim your wax, if for upper or lower set, to the contour and length. I once thought that sufficient, but now I get accuracy itself by taking two teeth, if plain teeth, or a couple of the blocks, if gum teeth, cutting away the wax exactly as it has finally to be cut away, to let in the teeth, and then simply set these samplers to the exact length and prominence they are to remain.

Lining Teeth.—In lining bicuspids and molars for gold plates, use heavier backing than for front teeth, as these teeth stand a greater strain. Also add a bit of plate, thus doubling the lining at the bottom next to the plate.

Before you extract for a set, take an impression of the natural teeth, and have it on your laboratory beside the substitute.

Arsenic.—Before applying for the destruction of a pulp, anesthetize the head of the latter by holding in contact a pellet of cotton, dipt in hot, carbolic acid. Most dentists use too much arsenic. If the decomposed dentine is properly removed, and the pulp fully exposed, a small pin's head size of arsenic is sufficient.

Facial Fistula.—When a fistula has opened on the outside of the face, on account of poulticing or from other cause, do not extract the offending tooth till you make an artificial fistula inside the mouth. The outside fistula will heal by granulation. If you extract the tooth before doing so, the tissue certainly will be greatly depressed, and an uglier scar result.

Over-Medication.—In treating alveolar abscesses, we may have too much of a good thing. Many a case of gonorrhea would get better if syringing was not so often persisted in. It is the same with pumping carbolic acid, peroxide of hydrogen, bicloride of mercury, etc., into alveolar abscesses. Periods of rest ought to be allowed, or only warm water substituted.

PULP EXPOSURE.

There are some cases where it is difficult to diagnose "Exposure of the Pulp." But there is one test that has *never* failed me. When I find the dentos sensitive at any point within the cavity of decay, then I am certain that the pulp is *not* exposed. The pulp may have only a thin, soft tissue over it, like a drum-head. Of course this must be left intact, then gently cleansed with broad instruments, water, alcohol, camphor spirits and creosote No pressure should be made on this "drum-head" in placing the filling; for the filling can be condensed in every other direction till the cavity is sufficiently filled to form a *solid* bridge over the pulp.—*Henry S. Chase, in Cosmos.*

A TEN CENT SHINE.

By putting a teaspoonful of sewing machine oil, and the same quantity of glycerine to a (5ct.) box of blacking it will be found that the polish to shoes or boots is made not alone very much superior, but the labor of doing this very much decreased. With these materials

added to the blacking a polish almost equal to patent leather is obtained in less than a minute. Should the box be full of blacking, the Oil and Glycerine in the same proportion may be used, say a drop or two of each, with which to moisten "the dauber" instead of saliva.

OBTUNDENT.

Cocaine is by no means reliable as an obtundent for sensitive dentine, but the best results obtained are arrived at when a saturated solution in glycerine is employed.

TO CLEANSE THE HANDS AFTER THE WORKSHOP.

Dr. M. Vogel, writing on the subject of cleansing the hands, says he has noticed that coppersmiths, tinsmiths, etc., whose hands become covered with a dirt from working in oxides and acids that cannot be removed by ordinary means, first rub them with warm oil, and when this has thoroughly penetrated, rub them with powdered borax. Subsequent washing with soap and water makes the hands perfectly clean. He advises those who have to use carbolic acid to go through the process above described first, and claims that in this way, (1) disinfection is made more thorough; (2) the hands are made purer than it is possible to make them with soap alone; (3) the hands remain soft and free from troublesome, rough epidermic scales, and the odor of carbolic acid is destroyed; (4) the uncomfortable anesthesia after washing with carbolic acid is avoided.

TO PRESERVE MERCURY PURE.

Keep it in a glass bottle holding one to two ounces, stopped with a cork through which is put a "chicken quill," the end of which comes to a point. At this point a hole is made for exit of the mercury. Cover the mercury with alcohol. This keeps the metal bright and clean. The glass bottle enables you to see the mercury—an advantage. When the bottle is inverted for use the mercury fills the quill and the alcohol always rises to the surface.

A REMARKABLE FISTULA.

In the *Deutsche Monatschrift fur Zahnheilkunde* for December, 1888, Dr. Nicolai, of Stuttgart, gives the history of a case in which a fistula opening at the nipple was found to be connected with a diseased molar tooth. According to a summary in the *Centralblatt fur*

Chirurgie, the connection was first inferred from the fact that the discharge from the opening just above the left nipple ceased at once after proper treatment of the diseased left lower first molar, and it was afterward proved by an injection of cochineal into the alveolus of the tooth, which caused a red coloration of the pus discharged at the nipple. Further examination showed that the pus had made its way through the maxilla, descended along the border of the sterno-cleido-mastoid muscle, perforated the fascia of the platysma myoides, and coursed over the pectoral muscle into the substance of the mammary gland. The fistula closed in twelve days after the removal of the diseased tooth.—*N. Y. Medical Journal.*

ANTISEPTICS.

By Dr. G. V. Black.

Giving the results of a recent series of experiments, telling the antiseptic qualities of a long list of agents, including many of the essential oils, aseptol, hydronaphthal, iodoform, ergenol, eucalyptol terpinol, salicylic acid, and many others. The culture medium used in all these experiments was a peptonized beef-broth, infected with his own saliva, each test tube being kept in the incubating oven five days unless growths of microbes appeared earlier. A growth of microbes appeared in the undissolved powder at the bottom of the tube containing *iodoform* proving this much relied on agent to have absolutely no antiseptic value in itself. The results in this case of the essential oils are very interesting, proving that some which are highly esteemed to have but little value, while others that are but little used are of great value.

In the oils of cageput, copaiba, coriander, eucalyptus, thyme and wintergreen, growths of microörganisms appeared in the emulsion. On the other hand the oils of cassia, cinnamon, cloves, mustard, inhibi growth in the proportions of 1-4000 (cassia), 1-2000 (cinnamon), 1-1200 (cloves), 1-1500 (mustard). Oil of pennyroyal 1-720, oil of peppermint 1-375, oil of sassafras 1-530. Carbolic acid 1-300; the 5 per cent. solution 1-8 to 1-15.

Various combinations have greater value than any of the constituents. Thus Dr. Black's favorite "1-2-3."

Carbolic Acid	1 part
Oil of Cassia	2 "
Oil of Wintergreen	3 "

has a range of antiseptic value greater than carbolic acid alone, with-

out its evil effects. Of the four forms in which antiseptics may be used—water, the oils, the dry powder, or hypodermic injections—washings are the least available in dental practice, as the application must be continuous to get the effect of the drug, as a continuous drip of from fifteen to twenty minutes, etc. Solutions in peroxide of hydrogen have a greater value to the dentist than in water. Antiseptic oils remain much longer in contact with the parts affected, and are, therefore, much more effective. In the selection of an agent, regard must be had not only to the antiseptic value, but also to the effect on the tissues by absorption, bearing in mind that the greater the range of value, the greater also the toxic properties.

TO SHARPEN INSTRUMENTS.

It is a good plan to place on the mandrel three discs,—one of thin metal, one of pasteboard, and one of emery paper, forming a flexible cushion, with even surfaces and no grooves.

DENTAL BROACHES.

A writer in the *Dental Review* makes the following useful suggestion: To convert jeweler's broaches into superior dental broaches, dip a dozen into sperm oil, lay on a sheet of tin or brass, ignite the oil, and allow it to burn off. This can be repeated until any degree of softness required is obtained. The same simple method of tempering may advantageously be employed for small instruments.

FILLING TEETH WITH VULCANITE.

By Morgan Adams, M. D., D. D. S., Sardis, Miss.

While considering the properties of vulcanized rubber, it occurred to me that it would be a good material for filling labial cavities of incisor teeth. I experimented with ordinary red rubber until I became satisfied that there was nothing superior to it for the purpose, except it be porcelain. In practice I use white rubber, of which several different shades should be kept on hand in order to match the different shades of teeth. The operation is so simple that it can be explained in a few words. Shape the cavity as for an ordinary gold filling, making slight undercuts and avoiding sharp angles. Then saw off a piece of rubber, which should be vulcanized, of suitable length, say about an inch or two long, and trim the end to approximate the shape of the cavity. Line the cavity with oxyphosphate, then grasp the

rubber with forceps and soften the end to be inserted in the flame of the spirit lamp and press it home. It should be held firmly in position until it cools, when it will be found that it has filled the undercuts and conformed to the shape of the cavity, and would require considerable force to dislodge it. It should then be cut off with a fine saw or separating file a little above the level of the tooth substance and, if necessary, burnished down around the edges with a hot burnisher, and then polished off. If care is used in selecting the proper shade of rubber, you will have a filling that is almost imperceptible. When white sheet rubber is not at hand, rubber goods—of which there is a great variety—can be used. For instance, the back of a white rubber comb. Gold is too conspicuous for labial cavities of incisors, and porcelain is of necessity expensive and is limited to perfectly round cavities, while rubber is not conspicuous nor expensive and can be used for almost any shape of cavities, provided you have definite walls.—*Archives.*

COTTON AS A ROOT FILLING.

I am not in favor of the use of cotton pure and simply for filling nerve canals; if you use it in conjunction with resin, wax or oxychloride of zinc, the virtue of the operation must be attributed to these materials, and not to the cotton, which only facilitates their introduction. More depends oftentimes upon the intelligence, skill and delicate manipulation of the operator, than any thing else; but you cannot hermetically seal a cavity with cotton alone.—*Dr. Dwinelle.*

COCAINE IN DEVITALIZING PULPS.

I see frequent remarks on the subject of the devitalization of dental pulps, but I see no item that mentions the use of cocaine for that purpose. I seldom use nerve paste, and then only in cases of congestion.

TAKING LOWER IMPRESSIONS.

Dr. F. C. Green in experimenting, in taking lower impressions, believes he has succeeded in finding a means by which a perfect impression may always be obtained in those difficult cases where the absorption has been great and where the attachment of the muscles is very close to the alveolar border, rendering it difficult to construct a plate that will not impinge upon the muscles and rise whenever the patient opens his mouth or raises the tongue. This method is as fol-

lows: Use a very narrow impression cup, one not much wider than the alveolar ridge; fill the cup with plaster, very soft, adding a little sulphate of potash to make it set rapidly. When hard, remove from the mouth, and with a small scraper, remove a thin layer over the entire surface of the impression; trim the edges, and especially the tongue. Place the impression in water for a few moments and when thoroughly wet fill it with very thin plaster, not thicker than cream; place it in position in the mouth with gentle pressure; observe that the buccinitor muscle be not impinged upon and request the patient to raise the tongue, letting the point rest upon the cup. When hard, remove, and if each step of the process has been carefully taken. the result will be an impression from which a plate can be constructed that will not rise or rattle while speaking. He never uses any thing but plaster for taking impressions of the mouth, believing it to be the only reliable material for this purpose.

DESTROYING NERVES.

Dr. Bryan says: We have to depend largely on the prepared pastes sold at the depots. The difficulty in preparing a nerve paste consists in the insolubility of the arsenic, or the preparation of an impalpable powder. Experiments which I have made with an expert chemist have only resulted in our getting a fine powder by dusting it through a cloth, after long pulverizing in a mortar. With one part of this powder I rub two parts of antipyrine and lanolin, to form a stiff paste.

The lanolin, in a dry cavity, seems to penetrate the tissue, and to cause the antipyrine and arsenic to act, the first reducing actual inflammation of the part, and preventing further pain during the action of the arsenic.

A combination of—

Arsenic..................................one-part,
Antipyrine..............................two parts,
Lanolin...................................two parts,

makes a painless devitalization possible.

Jumping toothache, is due to a dying pulp, confined without vent. Expansion of gases in the closed chamber causes pressure on the living portion.—*Ingersoll.*

Keep muriate of cocaine in one-grain packages, and for each operation make a fresh solution, using $\frac{1}{2}$ grain to 20 drops distilled water. —*Hugenschmidt*

Keep your gutta-percha under salt water, and it will remain good for many years. Eighteen, asserted by *Dr. Flagg.*

Lacto-peptine will digest minute portions of pulp tissue in root. —*Ingersoll.*

Antiseptics simply control or restrain the growth of microörganisms till a cure is affected.—*C. M. Bailey.*

Ten per cent. silica added to gold, will make it melt over the flame of a common candle.

Under cuts. In making dies, cores for under cuts in models may be made by mixing dry 10 per cent. common flour with 90 per cent. molding sand. Moisten more freely than for sand alone.

When a pulp is exposed from attrition or fracture, with no cavity of retention, shape a small concave hat of wax, to hold the devitalizing paste.—*W E. Barrett.*

Amalgo-gold fillings. Steurer's plastic gold, worked into the surface of a soft amalgam filling, in large proximal cavities, gives the appearance and edge strength of gold, with the care of manipulation of gold.—*D. M. Clapp.*

COSMETIC OINTMENT.

For keeping the hands white and preserving the complexion (of actors, in particular) Meyer recommends the following, to be rubbed in after a thorough washing and drying: Lanolin 100 parts, paraffin 25, vanillin 0.1, oil of roses sufficient. It is most conveniently kept in collapsible tubes, and is especially suited to the needs of physicians, who must frequently disinfect their hands.

ANTIDOTE TO CARBOLIC ACID.

According to the *Deutsche Medicinische Zeitung*, common soap is a very effectual antidote in case of poisoning by carbolic acid, provided its use is commenced immediately after the accident, and continued frequently until the dangerous symptoms have disappeared.

CURE FOR ACUTE CATARRH.

The following is recommended in the *Apotheker Zeitung:* Place a teaspoonful of powdered camphor in a deep vessel. Fill this half full of boiling water, and cover it with a cone of paper having its apex torn off so as to permit the introduction of the entire nose In this way the camphorated steam should be inhaled for ten or fifteen minutes at a time every four or five hours. Three inhalations will generally suffice to cut short the most obstinate coryza.

TO KEEP OFF MOSQUITOES.

Take a small quantity of a two per cent. carbolic acid solution and sprinkle sheets, coverlets, pillow, and bolster on both sides, the edges of bed curtains, and the wall next the bed. The face and neck may also be slightly wetted with the solution. Not a single gnat or mosquito, it is said, will come near.

Five per cent. of hydrochloric acid, added to the $\frac{1}{500}$ solution bichloride of mercury, protects it perfectly from decomposition, even in the full light of day. Without the acid loses power rapidly.

TEST FOR COLOR.

Place a button of amalgam that has one surface polished, into a solution of 40 to 60 grs. of sulpuret of potash in 1 oz. of water. Let remain 24 to 48 hours.

Carbolic acid, one tablespoonful to a quart of hot water, makes a 3 per cent. solution suitable for the disinfection of instruments.

Carbolic acid crystals one part, oil of cassia two parts, oil of wintergreen, three parts (1-2-3) has a range of antiseptic value much greater than carbolic acid alone, without the evil effects on the tissues.—*G. V. Black.*

THE

Dental Office and Laboratory.

FOURTH SERIES.

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THE DENTAL LABORATORY.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

(Continued from Page 139. No. 5. Vol. 3.)

CROWNS.

The Collar Crown. It sometimes happens that we find the roots of the central and lateral incisors and the cuspids, although considerably decayed in their labial aspects, with large portions of their palatal aspects still untouched by decay, and it behooves the dentist to save all such parts of the natural teeth, which experience teaches is best to preserve. If the enamel be examined on the different parts of the crowns of teeth it will be found, that in the upper incisors and cuspids it is thicker on the *palatal aspects* than elsewhere. This would seem to indicate that more strength was needed at this point of the tooth. Next to the Ferrule Crown there has been no Crown yet devised so strong as the Collar Crown. The bearing, or strain in biting, is brought almost entirely on the *palatal surfaces* of the upper front teeth in the normal close of the teeth, and it is in view of this fact that we should take advantage of every indication which points to the making of our work as strong and as serviceable as possible.

Fig. 72 represents the remains of a central incisor crown and root: A, being its *Palatal* and B, its *Labial* aspects. We prepare such a root by dressing down its face as shown at C, of the same cut. The foramen being closed and the canal being prepared for the dowel, we prepare for constructing the collar. This is done by taking a piece of pure gold No. 30 thick and of the size and

form shown at Fig. 73 A. It is then bent around the round handle of an excavator, first with the fingers and then by seizing the ends with a pair of flat-nose pliers. Transferring it to the root it is bent to fit this. The wider part of this band : *i. e.*, the part designed to cover or fit over the palatal part of the root and marked with a cross at "A,"Fig. 73, is then contoured into shape with the contouring pliers, as shown in B, Fig. 73. The spreading ends (caused by the slight elasticity of the metal) are brought together, while it is on the root, by holding it firmly with a pair of flat-nose pliers, and the band accurately burnished to fit all parts of the root. It is then carefully removed from the root and

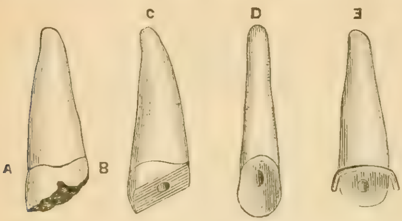

Fig. 72.

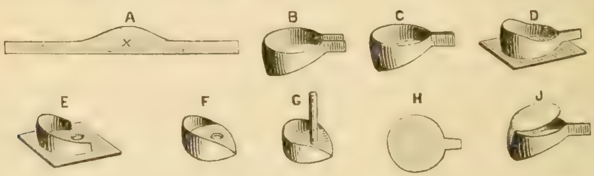

Fig. 73.

the ends soldered together as shown at C, Fig. 73. The top part of the band is now made perfectly flat, either with a fine file, or by holding the band against the side of a fine corundum wheel, revolved, and kept wet, in the lathe. A face plate is then soldered to it as shown at D, Fig. 73, the band being ligated to the face plate before soldering, in the manner shown in Fig. 68, at page 138, of the last paper. A hole is now punched with the plate punch through the face plate for the accommodation of the dowel, and the size of it increased, either with five-sided taper broaches, or with fine-cut sugar-loaf burs, as shown in Fig. 69, at page 138, of the last paper, and the protruding ends of the collar, which were seized with the flat-nose pliers when this was being fitted to the root, are filed down level with the face plate, as shown at E, Fig. 73. The collar should extend about three-quarters of the circumference of the root. The overhanging edges of the face plate are next cut off close to the collar (preferably with the cutting nippers, Fig. 66, of page 148, of the last paper), and then filed neatly, *but not flush*, with the edges of the collar, as shown at F, Fig. 73. The dowel hole in the face plate should be *well countersunk on the underside*, and it is then held for an instant in the blaze of the

spirit lamp to warm. A minute drop of adhesive wax is next applied to the *upper part* of the face plate, and this finds its way through the dowel hole and fills the countersink on the under surface. The dowel, being fitted to the root, it is then warmed and coated with a *film* of adhesive wax. The collar, with its face plate, is then placed on the root and the dowel pushed through, as far as it will go, into the root. It is then removed and more adhesive wax applied to the protruding end of the dowel and over the face plate. It is again placed on and into the root before the adhesive wax gets hard, and any little inaccuracies of fit rectified with the burnisher. It is now removed from the root, invested and soldered. The object of countersinking the dowel hole in the under side of the face plate, and of allowing the adhesive wax to fill this up is, that when the dowel is soldered to the face plate the solder will creep through and fill the countersink, thus holding the dowel securely to this surface, for, when the protruding end of the dowel is cut off, after soldering, it is often necessary to file this off *so flush* with the upper surface of the face plate that the dowel is very insecurely held, unless a provision of this kind be made. The collar with the face plate and dowel are shown at G, Fig. 73. A porcelain tooth (preferably one with cross pins) is now selected for the case; ground, fitted and backed. It is then gummed to the collar and face plate (G, Fig. 73), tired on the root, alligned, articulated, invested, finished, polished and inserted, as described for the other crowns.

It sometimes happens that although there may be considerable of the palatal aspect of the root left, nearly all of the face of the root, forward of this, is so scooped out that there is a concavity instead of a plain flat surface on the face of the root, as shown at D, Fig. 72. In such a case a flat face plate could not be soldered to the collar, because there would be a considerable space between the face of the root and the under side of the face plate. If the attempt be made to make the face plate fit into this concavity by burnishing heavily, the edges of the collar on both proximate surfaces would be thrown outward towards each adjoining tooth, as shown at E, Fig. 72, and therefore the collar would not fit; and if it be attempted to rectify this faulty fit of the collar by bending the collar inward, the face plate would resume its first position. Under these circumstances it will be better to burnish a piece of gold into the concavity with the collar still in position on the root, after it had been fitted and soldered, as shown at C, Fig. 73, or it may be still better done by fitting a piece within the collar and leaving a small extension, as shown at H, Fig. 73. This being done, the extension is tacked with a minute bit of solder to the back part of the collar, as shown at J, Fig. 73, and then the collar placed

over the root. The face plate may now be accurately burnished to fit the concavity of the face of the root, when it is removed (preferably invested) and soldered. This being done a hole for the dowel in this concave face plate is made, the dowel inserted and the rest of the work carried to completion as described in the other case.

THE METAL, OR ALL-GOLD CROWN.

In the construction of this style of crown the end of the root is prepared in the same manner as described for the construction of the "Ferrule Crown." This being done the size of the end of the root is taken, whether for a *molar* or a *bicuspid*, by twisting a piece of binding wire around it, as shown in the cut Fig. 61, page 136, of last paper. It may be well to remark here that there is frequently a depression or flattening on the sides of the bicuspid roots which, when the wire that is twisted around them, should be burnished or pressed into these depressions, so as to get the exact form of these roots before the wire is taken off. When taken off, it should be laid on a piece of straight-grained wood and treated as described for the ferrule crown, as shown at Fig. 62, page 136, of the last paper. These directions apply alike for a bicuspid or for a molar crown. A piece of pure gold about 3-16 of an inch wide and about 1-16 of an inch longer than the wire measure of the root should be chamfered to a feather edge on both ends, lapped and soldered, as described for the ferrule crown. It is then fitted to the wooden model of the root which has been whittled and filed into the shape indicated upon it by the wire pattern, which was driven into it. This being done it is tried on the root to ascertain its fit. It may be well to make the wooden model the *merest trifle smaller* than the root, so that if the ferrule should not pass over the root snugly it can be stretched by a few light blows of the riveting hammer on the horn of the bench anvil.

Fig. 74.

The ferrule being fitted to the end of the root, as shown at A, Fig. 74, it is then contoured with the contouring pliers. This contouring, however, will not be enough; for though the metal may have been stretched and puffed where the contouring pliers pressed the metal, it will be found that the part of the ferrule which hugs the root and the part to which the cap is to be soldered are both of the same size. After this first contouring is accomplished the upper part of the ferrule (not the part which encircles the root) is held delicately on the end of the round horn of the bench anvil by the fingers of the

left hand, while with deftly delivered blows of a light rivetting hammer in the right hand this part of the ferrule is stretched until it is the same size as the part which was contoured. The ferrule is now carefully annealed, and the contouring pliers again used, and the same manipulation of the anvil again gone over until a sufficient stretching of the band or ferrule is attained at its upper or masticating border,

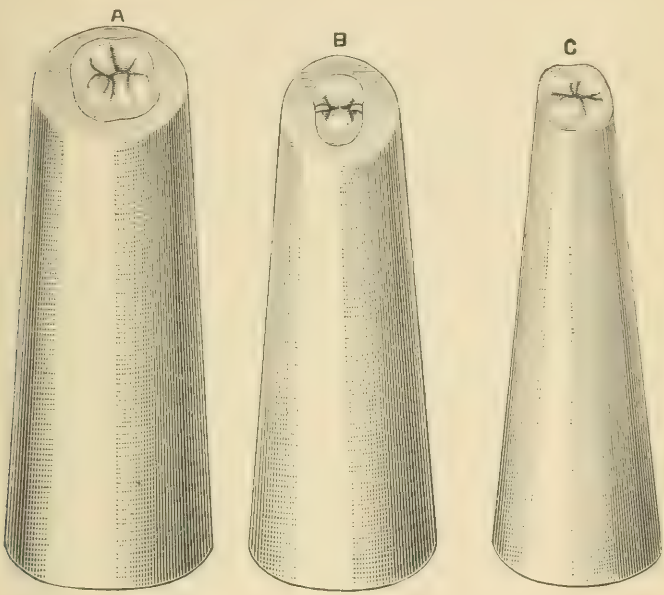

Fig. 75.

as shown at B, Fig. 74. We should have said that when the ferrule is first made and fitted to the root end, the operator should ascertain the proper height of the band by letting the patient close the teeth, allowing sufficient space between the upper edge of band and occluding teeth for the soldering on of the cap of the crown. After the ferrule has been stretched on the anvil, as indicated at B, Fig. 74, it is again annealed and again contoured with the contouring pliers, as shown at C, Fig. 74. The cap (or cusps) is now made. Quite a number of devices for this part of the work are on the market and for sale at the depots. To make these for one's self, extract natural teeth which are sound or which may be made perfect in shape and contour by filling the decayed places with phosphate, cement or amalgam, may be placed on a glass slab with the crown downward,

stuck into a small bit of wax to keep them in position. A small round pasteboard box about an inch in diameter and two inches high may be placed over each tooth on the slab, by cutting off the bottom of the box and the whole inside of the box filled with plaster of Paris. When this hardens, the boxes are removed and the plaster trimmed to a conical form, leaving only so much of the cusps of the natural teeth which are imbeded in the plaster peeping out, as shown in Fig. 75, A and B. A number of them may be made of molar and bicuspid crowns so as to have a selection of sizes to meet different cases, and if old natural teeth be not procurable these patterns may be made of porcelain teeth for vulcanite work, the carving of these being so close an imitation to nature as to subserve all the purposes for which they are needed as dies. The patterns being made, they may be sent to a brass founder, who will make accurate castings of them. It is well to instruct the brass founder of what kind of brass they should be made, as they have different formulas for making this metal, some formulas being intensely hard. The dies should be cast of *hard brass.* Some operators in having these dies made bring the plaster flush against the side of the tooth, as shown at C, Fig. 75. This plan is not as good as the other, for when the gold is stamped over the style of die A and B. the collar can be fitted into the depression with a little bending, while the part that is swedged against the shoulder of the die serves as a ledge on which to lay the solder to unite the two parts.

After the ferrule has been made as described, the cap is then swedged; this is done by laying a piece of pure gold, of the same thickness or a little thicker than the ferrule, on a piece of lead and driving the die into it until the gold cap is driven up sharply into every indentation of the die. It may be well to caution the operator about this part of the work. As soft as pure gold is, it is liable to crack if handled roughly, and frequently we have had holes made into these caps because of not taking the necessary precaution of *frequent annealing of the gold*, as well as of not *coaxing up* the metal until it is led by degrees into its new form. *Anneal frequently* and *stretch carefully* over all *elevations* on the die.

Fig. 76.

The cap as stamped up under the dies is shown in Fig. 76. The band, or ferrule, prepared as has been described, is now tied to this cap with *very fine* binding wire, as shown at Fig. 77. *Tight binding wire should be avoided*, and only *very fine* binding wire used, the object being merely to hold the parts in accurate relation until the two pieces are bound together by the

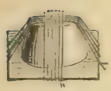

Fig. 77.

solder. With this, as in soldering all parts, the *fittings must be perfect* and the parts well painted with borax ground to a creamy condition with water. Before putting on the solder the parts should be heated red hot, so that the borax may melt; if the solder is put on at the same time with the borax, the water of crystallization, in passing out of the borax, causes the flux to swell up and expand, and when this subsides the solder may not be in the place it is wanted, or perhaps the sudden heating may cause the solder to fly off and leave the parts altogether.

The crown is now boiled in acid to remove the borax, after which it is filed up and finished. It may be well in doing this to fill the crown with *impression plaster*, mixed thin (which never gets very hard), to avoid the liability of bending the crown while finishing and polishing it.

Some operators prefer to fill the cap, by melting gold of a lower carat into it, and thus to have the cap solid; but this may or may not be done. The occluding surface is just as hard when filled with cement as when made solid by filling with gold.

These crowns are inserted with Phosphate of Zinc Cement. The root is generally provided with a screw post or pin head, set in with Phosphate Cement, and the crown being larger within (at its occluding surface) than at its neck, when the two portions of cement, on the root, around the pin and in the crown, all coalesce into one mass there is little liability of the one separating or dropping away from the other.

THE NATURAL CROWN SUBSTITUTE.

A SUGGESTION.

We offer the following suggestion which may meet some cases. We term it "The Natural Crown," as it is made from the crown of a natural human tooth. It sometimes happens that for the relief of a crowded condition of the dental arch, a natural tooth is extracted without blemish; but even should it be decayed, this will be no hinderance to the operation, as the decayed places may be nicely burned out and filled to the proper contour with gold or amalgam.

We will take a typical case—an upper molar—the remains of the root are filed or ground down flat a little above the level of the gum. The roots are reamed out, cleansed, treated and filled, and the pulp chamber prepared, as shown at Fig. 78, A. The crown of an upper molar of the proper size and side is selected, filled in its decayed

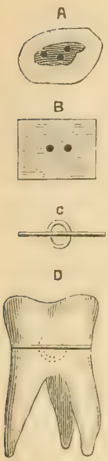

Fig. 78.

places (if necessary) and sawed off at its neck. The pulp chamber of this is likewise prepared by proper reaming with the burs of the dental engine.

We may say here that if any use is proposed to be made of *old extracted human teeth* they should be kept in a glass jar submerged in *a strong brine*, or preferably in a jar of alcohol. If allowed to become dry after extraction they get so brittle that nothing can be done with them in the matter of cutting, reaming or preparing them for filling.

When the roots and crown are prepared as described, the pulp chamber of the crown is filled with wax, and placed in position on the root and the proper occlusion is thus obtained. This being done, the crown is filed or ground down, at its neck, about the thickness of a card-board or a little more so as to shorten it this much, for reasons that will be apparent. A piece of gold plate of 18 karat fineness, and about 28 or 30 thick, and of a size that will amply cover the neck of the crown is punched with the plate punch with two holes about the 1-32 of an inch apart, as shown at B, Fig. 78. These holes are countersunk. A piece of wire, bent like a staple, is passed through these holes and soldered to the plate, with two minute pieces of solder flowed into the countersunk holes, and the protruding ends of the wire on the other side of the plate are bent so as to form another staple or loop, as shown at C, Fig. 78. The plate as thus constructed is filed to the proper size, as indicated by the size of the neck of the crown or root. The root is now well dried, and the proper provision made for the exclusion of moisture. The pulp chamber is filled with Zinc Phosphate Cement and a little of the same placed within the loop on the plate. The plate is placed on the root and kept in close contact with it until the cement sets. The crown, in its pulp chamber, is then filled with cement, a little placed within the loop of the plate, which was cemented to the roots, and the crown carried to its position. After the cement hardens, the operation is completed, with the exception of scraping such small portions of the cement as oozed through between the root and the plate, and between the crown and the plate. There is nothing to tell this from a natural crown substitute except the line at the gum margin showing the plate which binds the roots and crown together, as shown at D, Fig. 78, the dotted lines showing the staples on the plate imbedded in the cement.

The making of dies and counter dies *promptly* is quite an impor-

tant consideration in many operations connected with laboratory work, and much credit is due Dr. Melotte for his valuable suggestions in this direction. The moldine which is offered for sale under the name of "*Melotte's Moldine*" is quite serviceable when it is necessary to have a die and a counter die, and with it, these may be made almost as promptly as the making of a plaster model. We do not know of what the moldine is composed, but believe it to be "Fuller's earth or pipe clay mixed with glycerine to the consistency of putty." For making crowns, repairing a cracked plate and many other operations of the laboratory this material will save much time and very many useless and vexatious efforts. Thus in repairing a cracked plate, it is difficult to bend a piece of plate over the crack so as to assist the solder (which should never be depended on *alone* to remedy and strengthen such a disaster) in giving stability to the repair. True, a piece of thin platinum, or thin pure gold plate, may be burnished over the crack and be made to fit *approximately* well, for the repair of such cases, but a piece of gold plate *of lower karat* swedged to fit over the crack makes a better and more substantial job and easier soldering. We give below formulas for making die metals which melt at different temperatures. They will be found serviceable for the die and counter die:

No. 1. Melts at 212° F.

Bismuth..................2 parts,
Lead......................1 part,
Tin........................1 part.

No. 2. Melts at 176° F.

Bismuth..................20 parts,
Lead......................12 parts,
Tin........................ 7 parts,
Mercury.................. 4 parts.

No. 3. Melts at 151° F.

Bismuth..................$7\frac{1}{2}$ parts,
Lead......................4 parts,
Tin........................$1\frac{1}{2}$ parts,
Cadmium..................2 parts.

No. 1 may be used for the die, and either No. 2 or 3 for the counter die. It is well always in making a counter die to take the precaution of painting *the face of the die* with thin whiting and water and of drying this before pouring the metal for the counter die.

In Fig. 79 is a cracked plate invested for repairing the crack. A piece of plate P is (preferably) swedged to fit over the crack and held

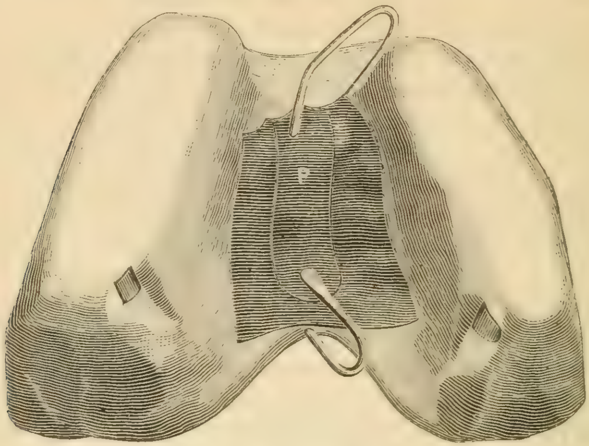

Fig. 79.

in position by two iron wire clamps—one of these is made like the one represented at Fig. 33 of these papers, which is applied towards the roof of the mouth, and holds the swedged piece immovably at that point, while another, made of iron wire like Fig. 80, is placed towards the buccal or labial surface of the plate, which holds the swedged plate securely at this point. These clamps are applied *before* the plate is invested; the plate having been boiled, first in a strong solution of soda and water, and next in a solution of sulphuric acid and water. Both the plate and the swedged piece should be well scraped so as to free them *of every particle of dirt or grease.* Before applying the swedged piece the *plate* should be painted with a creamy solution of borax and water and the *swedged piece* also. The clamps are then applied, and the piece with the clamps in position is invested as shown in Fig. 79.

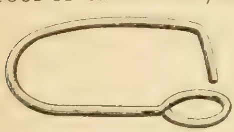

Fig. 80.

It sometimes happens that in making a metal crown for a root either in the upper or lower jaw, that from the long loss of the crown of the tooth, the upper or lower antagonizing tooth has grown so long (from the lack of antagonism) that we cannot supply the substitute to its original length. It is in such cases that Dr. Melotte's Moldine comes in for special service. The root being prepared and a ferrule fitted to it, (the ferrule) is filled, while in the mouth, with ad-

hesive wax. The patient is directed to close the teeth and the antagonism or occlusion is taken, the surplus of adhesive wax is neatly cleared away from around the ferrule and its edges. The adhesive wax is still farther dressed away, to allow for the thickness of the cap which is to be soldered to the ferrule. The wax is then well chilled with iced water, the parts being protected from moisture with a mouth napkin, the teeth and adjacent gums carefully dried, and the parts sprinkled with fine powdered French chalk or soapstone from a bottle with a perforated cover, like a pepper cruet. To do this sprinkling in the *upper jaw* one of the small bellows such as is used for sprinkling insect powder in cracks will be found to work effectively. We now take an impression of the parts *with moldine.* To do this improvise an impression cup out of a piece of sheet brass about an inch wide and about three inches long. Bend it as shown in Fig. 81, and place the moldine within at C, then take the impression. When the impression is taken, scrape off carefully any of the moldine that has been pressed outside the margins of the impression cup, and with a wax spatula or the blade of a penknife fill up, on each side, the impression cup at the points marked A and B, so that should any of the die metal run over, it will not enter these points. A piece of large rubber tubing, about $1\frac{1}{2}$ inches long, may be stretched over the impression and cup, as shown at Fig. 82, and any place within the ring where the melted metal might run should be filled with moldine. In the absence of large rubber tubing the moldine may be kneaded into a strip like a piece of base plate wax (only rather thicker than this) and this strip used to encircle the impression within the impression cup. This may be still further strengthened and held into shape by wrapping a strip of paper several times around it before pouring the die metal.

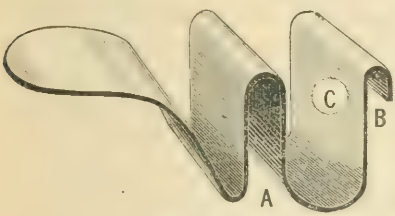

Fig. 81.

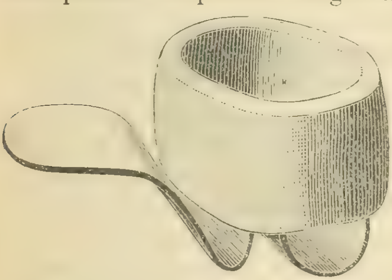
Fig. 82.

Haskill's Babbitt metal may be melted and poured into the rubber ring. When cold a counter die may be made of Haskill's counter die metal. All this manipulation may be accomplished almost as soon as it has taken to write out this description. There is an impression

cup made for the use of Dr. Melotte's Moldine, but the metal of which it is made will not stand the heat of Haskill's Babbitt metal. To use this metal for the die, the cup would have to be made of brass, such as we have indicated, or if such an impression cup be used, then the metals we have given the formula of as No. 1, at page 169, will have to be used for the die, and either of the others (Nos. 2 or 3) for the counter die.

With the die and counter die made, a cap can be swedged to fit over the ferrule, which was fitted around the root, soldered, finished and afterwards inserted.

Dr. C. D. Snow, of Minneapolis, says: "In making gold crowns from plaster models of the teeth, in the old way, that is, making the die out of the *harder* metal, and the counter out of the *softer*, you will find that the crown is much larger than the plaster model; but if you will reverse the metals, making the die out of the softer, and the counter die out of the harder, you will find the crown to be about the same size. In making the die you can use pure lead, and run Haskill's Babbitt metal over it for a counter.

REPAIRING.

Cases frequently come in which require repair. One of the most frequent is the breaking off of the dowel in the root. This is especially the case in such crowns as are explained at page 130 of the September number. The crown is in all respects perfect, but the pivot is broken off. The procedure for repair is as follows: The fractured part of the pivot is filed flat, next the under side of the face plate, and a minute hole drilled in the center of where the old pivot stood. This hole should be about the 1-32 of an inch deep and well countersunk. A piece of gold wire of the proper size and a trifle larger than the old pivot, is put in the chuck of the lathe (See Fig.

27 of these papers) and the end turned or filed, as shown in Fig. 83, of a size to fit into the hole that was drilled into the face plate, as shown at A. The upper end is notched, as shown at Fig. 83. B. A piece of iron wire is bent, as shown at Fig. 84. The crown is slightly warmed and a film of adhesive wax placed on each

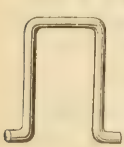

Fig. 84.

side of it. The piece of wire, Fig. 84, is likewise warmed and the crown placed between the arms of Fig. 84, as shown at Fig. 85. The point of the dowel, A, Fig. 83, is then entered into the hole of the face plate and the top bar brought down into the slot or groove of the dowel, B, Fig. 83. The crown, while held, as shown in Fig. 85,

may be passed to and fro, quickly, through the blaze of the spirit lamp so as to slightly soften the adhesive wax, to enable the workman to press the bar down into the groove of the dowel, B, Fig. 83. The case is then invested, as shown in Fig. 86. A small piece of solder is placed at the point of the dowel that enters the hole in the face plate, sufficient to fill the countersink, when it is soldered.

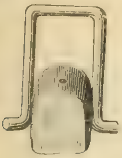

Fig. 85.

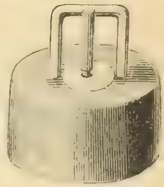

Fig. 86.

After trying it into the root, should the *direction* not be exactly correct, the dowel can be bent slightly, if it is done carefully.

(To be Continued.)

CELLULOID.

Frederick W. Seabury, Providence, R. I.

The cause of irritation and inflammation of the mucous membrane covered by an entire artificial denture has always been a fruitful theme for discussion.

Take a plaster model of the jaw made granular by the use of salt or potash, the surface soaked with oil, and then after packing, boiling, forcing the flask together and steaming in a water bath for nearly two hours, is it to be wondered at that rubber plates never fit a plaster model of the jaw?

Swedged metal plates, except in rare cases, are little better than rubber, swedging will level the model better even than boiling water, and soldering will contract and warp the plate.

The mucous membrane, represented by the delicate ridges and follicles on the plaster model, which have become obliterated by these processes, will be forced out of its normal position, and of course become inflamed when the plate is worn. These compressed rugæ and follicles will act as a constant force pushing the plate from its seat.

Vacuum chambers, ridges, suckers, etc., were invented to assist the bungling dental mechanic in getting his patient's money before the abortion could be discovered.

Conductivity and cleanliness are the two qualities which make metal plates superior to vegetable plates.

CLAIM.

Celluloid plates moulded on metal dies in a dry chamber, the plaster investment being heated to 315° Fahr., will fit perfectly the metal

die, the plaster model, or the mucous membrane covering the patient's jaws.

I have several celluloid plates made seven years ago, which are perfect to-day. One set made with Allen's continuous gum teeth with the long pins ground off smooth is a positive proof that celluloid properly manufactured *will adhere to the teeth* and neither warp, creep nor shrink.

In every case where I have substituted celluloid plates for rubber the inflammation of the mucous membrane and adjacent tissues have subsided never to appear again.

The only essential difference between a rubber and a celluloid denture made for the same person will be the perfect fit of the celluloid plate. Practically the perfect fit of the celluloid plates counterbalance the conductivity of metal plates so far as inflammation is concerned.

IMPRESSION OF THE MOUTH.

In order to produce the results claimed, the impression must be perfect, no matter how many times one has to try.

Select a tray which, when placed in position in the mouth, will not press the buccinator muscle and other soft tissues out of their normal position. Take the impression with wax,—for any inflamed or soft tissues, the rugæ especially, there should be corresponding cavities cut in the wax. This is the one great advantage of using wax and plaster. Distribute about a teaspoonful of plaster the consistency of cream evenly over the wax and take the impression.

CAUSES OF FAILURE.

Attention to little things is the secret of success with celluloid. The chief cause of failures, when moulding celluloid by either steam, oil or dry heat, is owing to the form of the blanks which could be easily remedied by changing the moulds, which necessitates from a half to an hour's hard work of scraping and filing, with the result then of only a faint approximation to what a blank should be.

That the color of the celluloid blanks could be made to resemble every shade of mucous membrane, no one can doubt who is at all familiar with the innumerable articles of every conceivable shade now on the market.

The tendency of celluloid to warp and discolor can be overcome by moulding it in a plaster investment heated to a temperature of 315° in a dry chamber.

The moulding at this high degree of heat must be done inside of five minutes, or the celluloid will either become porous or burn.

The judgment now necessary to mould a celluloid plate in five minutes, and have the denture come out perfectly finished, all ready to be placed in the patient's mouth, without any filing or polishing, requires mechanical ability of a very high order trained by long experience.

It seems to me that the following instructions will enable any mechanical dentist to make a perfect celluloid denture every time without a failure:—

Celluloid must be moulded on metal dies in a dry oven; steam makes it porous and should never be used. Coarse, slow-setting plaster is absolutely necessary.

INSTRUCTIONS.

There is but one right way to make a celluloid dental plate. First, shape the model so that it will draw out of the sand easily and coat with sandarac varnish. Deep undercuts should be filled with plaster cores, which, after being dried slowly, will leave a smoother surface on the metal than sand would. Stop pouring the tin the instant the mold is covered, as the smaller the tin model is the better. Place the model thus made in the nowel and file it until it rests on the bottom without touching the sides. Warm a sheet of paraffine and wax, and stretch it as thin as it will bear without parting; place this on the tin cast, which has been previously warmed; trim to the desired shape; apply cold water, and it will come off the tin without sticking. Remove from the articulator the gutta-percha trial-plate and wax with which the bite was taken, and in its place adjust the plate which was fitted to the tin cast. Set the teeth up by dropping the melted paraffine and wax over them; chill the mass in cold water, and use a mouth blowpipe held in the *centre* of the lower cone of the flame of a Bunsen burner to soften the surface where carving is desired. After carving run a bead one-sixteenth of an inch wide around the top of the gum. (See note.) Change from the articulator to the warm tin model; press carefully into place; run a little paraffine around the edge, being very careful to exclude all air and water from between the paraffine and tin. Try each tooth to see that the paraffine adheres, otherwise they will be moved out of position when they are invested in plaster. Burnish tin-foil lightly but smoothly to the paraffine, and stipple all over with a serrated plugger. The bead of paraffine covered with tin-foil should be one-quarter of an inch above the plaster which holds the tin model in place, and the plaster should then be sloped to the edge of the flask.

NOTE.

Before changing the paraffine plate with the teeth from the articu lator to the tin model, make a *duplicate paraffine plate* and invest it on the tin die in the flask the same as you would if the teeth were on it.

Scrape and file a celluloid blank, especially in the roof, until it is as near the form of the paraffine pattern as possible. Heat the plaster investment and mould at about 270°. Get the plaster all off of the celluloid, even if you have to polish it. You will then have a *perfect blank*, which can be easily moulded on to the teeth in five minutes, without any danger of crushing the teeth or cracking the investment. This process saves time and teeth, and there is a greater demand for these perfect celluloid plates at thirty dollars ($30) each, than for rubber plates at ten dollars ($10) each, by the same class of people.

In the seven years that I have made celluloid plates by the dry heat process, I have never seen a broken one. The teeth break the same as on other bases.

To get the position and angle of the tin model, before pouring the plaster into the nowel, place the model in position on a frame-work of matches. These matches will remain in the plaster and will serve to support the heavy tin model in its correct position, no matter how soft the batter may be when poured. When the plaster sets, shellac and grease those parts not covered by the tin-foil. In placing the model in the nowel, be careful to place it as near the back of it as possible without touching.

If this has been done and the top ring put on, there will be a space between the teeth and the ring wide enough to run your finger around; larger sets, of course, will leave less space.

Now comes the all-important part which, if slighted will take ample revenge. Fill a pint bowl nearly full of water, place a tablespoonful of plaster in a fine sieve and shake it gently over the water; each atom of plaster when saturated with water will sink, so shake slowly, giving each layer time to become saturated. If a cake is formed, it will sink to the bottom as dry plaster, which will form bubbles, making the cast porous, and invariably cause the celluloid to be porous also. Stir occasionally with a wet knife. Continue till about five or six tablespoonfuls have been sifted in, when the mixture will be about the consistency of cream. Let it stand five or ten minutes and pour off the surplus water. Pour the plaster into the flask at the

corner, in a small stream, guarding the teeth with the plaster knife, so that the plaster will strike the shellac first and rise slowly around them. When on a level with the ends of the teeth, stop pouring. then, grasping the two parts of the flask between the thumbs and fore. fingers, pound it against the bench for five minutes. This will cause the plaster to settle and the water to rise. If any bubbles do appear, you have made a mistake somewhere. Take a pinch of dry plaster between the thumb and forefinger and scatter it evenly around the edge of the flask. Now repeat the process of pounding and apply-

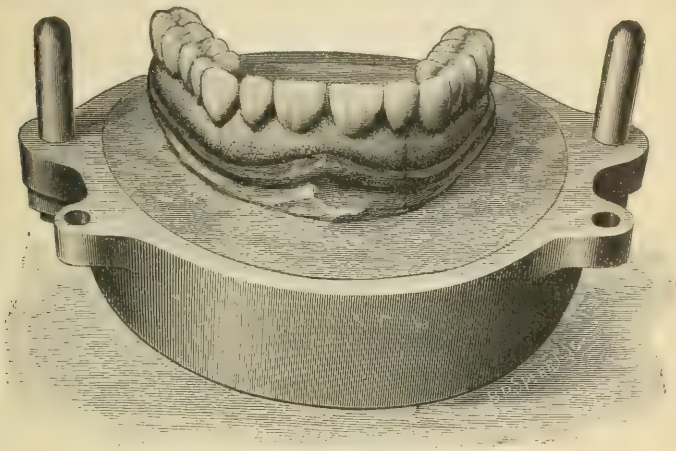

Fig. 1.

ing dry plaster (at the edge only), until all the water is absorbed and the investment is dry, then fill the flask with soft batter and put the cover on. If plaster falls into the center of the investment first, it will form a cake and prevent the water from rising. The more time the investment has to set the better, therefore, it is well to invest the last thing before leaving the office, then you can easily finish by noon the following day.

It is necessary to have an inclined-guide, removable-pin flask. Remove the pins and the flask will easily open without breaking the projecting investment over the alveolar ridge. A small stream of boiling water from a coffee-pot will wash out the paraffine, exposing the tin-foil.

MOULDING.

Close the flask and leave it in the oven, the top side of the flask down, until the thermometer registers 320°, which should take one

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See Richardson's Mechanical Dentistry, 4th ed., page 594, for Celluloid flask.

hour and a quarter when the machine is cold and 15 minutes less when hot, by which time the tin and plaster investments will have reached that degree of heat, when using the Seabury Celluloid press. If on applying a wet finger to the tin cast there is a hiss, it is too hot. Let it stand for a few minutes. When sufficiently cool, place the flask containing the celluloid blank in the heater. Apply pressure very gently at first. In from five to ten minutes the flask will close. In any case do not continue the heat in the machine longer than ten minutes.

When the flask is closed, lock, remove from the oven and place it in water until the plaster is soft. If with a knife or other suitable instrument you can not pry the celluloid off the metal cast, put it in a tin basin of cold water over a flame. The tin cast will heat before the water boils, when the plate will be easily removed.

TO REPLACE A BROKEN TOOTH.

Select a tooth, cover the pins with an excess of paraffine, place it (paraffine) up in the lower half of a flask filled with plaster; fill the upper half of the flask with plaster, open the flask and remove the paraffine; heat the investment and melt a piece of celluloid on to the tooth the same as if you were moulding a whole denture.

Enlarge the cavity left by the broken tooth, on the lingual side. After grinding the tooth and shaping the celluloid until it fits perfectly, cement it in place with collodion. The union of the celluloid will be perfect, and the tooth will be held as firmly in place as any tooth in the plate.

REMARKS ON DR. SEABURY'S PROCESS.

We have been in correspondence with Dr. Seabury on the subject of "Celluloid," his paper being laid before our readers in this issue, our object being to give them the benefit of his views and our experience carried out by actual practice. In this matter we desire to lay before our patrons all the *minutiæ*, as clearly described as we can make them.

Firstly: The celluloid is pressed up on a metallic die. This die is made of tin or bronze metal. Tin dies are made with more facility. The dies should be quite low, not more than one-eighth of an inch thick over the arch of the roof of the mouth.

Secondly: A thin paraffine base plate is made on this die and the teeth (plain vulc teeth) mounted on it, in accordance with the articulation. The fullness of the gum, the festoons and the undulations of

the same are carried out as if the case were ready for flasking, when a plaster matrix is made over the labial surface of gum and tooth, as shown in Fig. 1.

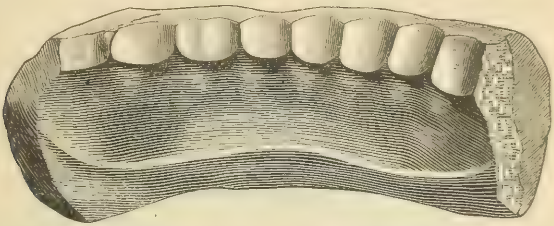

Fig. 1. (Which shows one-half of the matrix.)

The matrix is divided at the center and the two halves lifted off.

Thirdly: The paraffine is well chilled in cold water and the adhering water wiped off, when each tooth is warmed and carefully lifted away from the paraffine base plate. When all the teeth are lifted off, the places where they stood, on the paraffine base plate, is filled by dropping some melted wax, in small quantity, in each place, so as to allow for a slight surplus.

The case is now flasked (without the teeth). In separating the flask all the paraffine used for *waxing* up should be saved. A celluloid blank is now pressed up, as shown in Fig. 2.

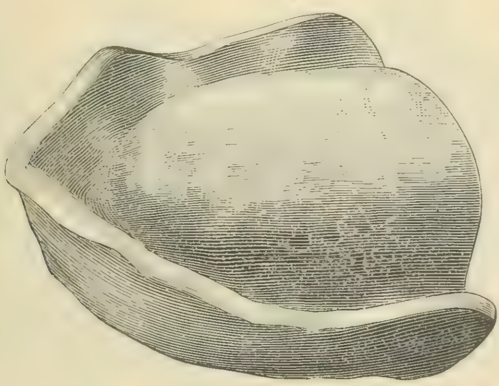

Fig. 2.

Fourthly: The paraffine base plate saved is used again on the die, the matrix placed in position, the teeth placed in their receptacles in

the matrix and the case again waxed up exactly the same as before the teeth were taken off. No more paraffine should be used for this second waxing than was employed in the first case.

Fifthly: Thick tin foil (No. 60) is neatly burnished over the gum surface and teeth, and stippled in imitation of the gum, as shown in Fig. 3.

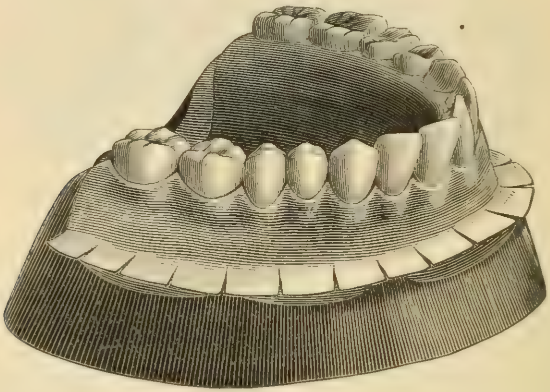

Fig. 3.

The edges of the tin foil are clipped with scissors, as shown in the cut, and these are bent at right angles to the gum surface, so as to engage into the plaster investment.

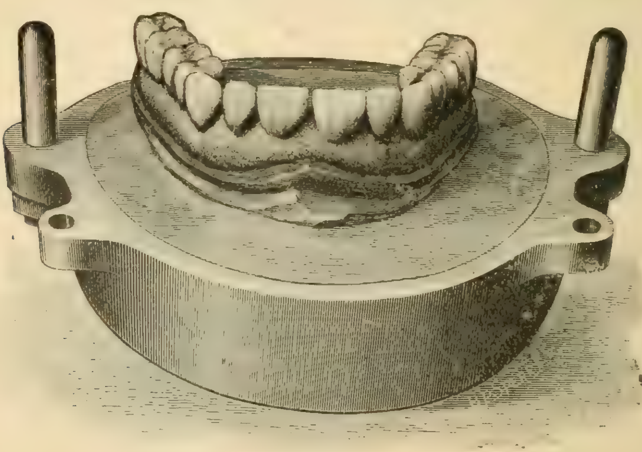

Fig. 4.

Sixthly: The case is flasked, as directed by Dr Seabury, so as to allow a large bulk of plaster in front, as shown in Fig. 4.

This detailed description is the manner we have proceeded in our effort to lay this matter clearly before our readers. Dr. Seabury considers that "an inclined-guide, removable-pin, lock flask is an absolute necessity in the majority of cases, especially in a projecting alveolar ridge." Ed.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS COMPILED FROM DIFFERENT WORKS.

By Theodore F. Chupein, D. D. S.

Q. How is the mouth bounded?

A. By the *palatine arch* above, the *tongue* and *mylo-hyoid muscle* below, the *lips* in front, the *uvula* or *velum palati* behind, and the *cheeks* on each side.

Q. What do we find in the mouth?

A. The tongue, the teeth, the alveolar ridges covered with gum, the mucous membrane, covering the cheeks and soft palate, and the salivary glands.

Q. Mention the names of the salivary glands?

A. The Parotid, the Submaxillary and the Sublingual.

Q. What is the use of the teeth?

A. To grind or cut up the food into small particles.

Q. What is this process called?

A. Mastication.

Q. What is the use of the saliva?

A. To mix and still further soften the food, to render it fit to be swallowed.

Q. What is this mixing process called?

A. Insalivation.

Q. After the food is mixed with saliva and formed into a ball ready for swallowing, and then swallowed, what is this act called?

A. Deglutition.

Q. Can you mention the anatomical elements composing the mouth?

A. Bone, ligament, muscle, gland, blood vessel, nerve, areolar and adipose tissue, and mucous membrane.

Q. What is bone?

A. It is one of the hardest substances of the body.

Q. What is ligament?

A. It is a strong, compact substance, serving to bind one bone to another. It is a white, solid, inelastic, tendinous substance, softer than cartilage but harder than membrane.

Q. What is muscle?

A. It is the organ of motion. Muscles are of two kinds, *voluntary* and *involuntary.* Voluntary muscles are composed of bundles of parallel, delicate fibers, cylindrical in shape generally, and of a reddish color. The voluntary muscles are streaked longitudinally and transversely. They act in obedience to the will and contract suddenly. The involuntary muscles are composed of bundles of spindle-shaped, non-striated fibers, and are of a whitish color. They are not obedient to the will, and contract slowly. The voluntary muscles constitute the flesh of animals; the involuntary muscles are found in the stomach, alimentary canal, uterus, bladder, skin, heart, etc.

Q. What is a gland?

A. It means a little acorn. It is a collection of cells, having the power of secreting, or separating some peculiar substance from the blood or animal fluids. It is composed of follicles opening into a duct or canal for the conveyance of its product to a certain point.

Q. What is blood?

A. It is the fluid which flows through the veins and arteries of the body. It is red in color. The blood of the arteries is of a bright red color, that of the veins of a bluish color. It is regarded as the fluid of life.

Q. What is a nerve?

A. It is one of the bundle of fibers which establish a communication between the various parts of the body and the brain and spinal cord, or central ganglia. The nerve fiber is an exceedingly delicate tube of transparent membrane, enclosing a band or conducting cord which is uninterrupted from its origin in the central organs to its peripheral end, and is insulated by a fatty substance which fills that portion of the tube not occupied by the central band. Then fibers bound together by fibrous tissue constitute a nerve.

Q. What is areolar tissue?

A. It is a loose mixture of the white fibrous and yellow elastic tissues; it is so called from its interspaces. Areolar tissue is the loose texture which connects the skin with the parts which lie beneath and next to it.

Q. What is adipose tissue?

A. It is an assemblage of minute round vesicles, containing the fat, closely agglomerated, and imbedded in the spaces of the common cellular tissue.

Q. What is the mucous membrane?

A. That membrane which lines all the cavities of the body which open externally, and which is continuous with the skin. It secretes the fluid called mucus.

Q. What is Bone?

A. It is one of the hardest substances of the body. It is of a dull white color.

Q. Of what two substances is bone composed?

A. Of Animal or Organic and Earthy or Inorganic matter.

Q. From which of these substances does bone owe its toughness and elasticity?

A. To the Organic matter.

Q. And to which its hardness and solidity?

A. To the Earthy or Inorganic matter.

Q. Are there any means of depriving bone of these constituents?

A. Yes. By steeping the bone in dilute acid; this deprives it of the earthy matter, when it becomes like cartilage and may be bent, twisted or tied into a knot. Or by subjecting it to high heat—the Animal matter is consumed, when the bone retains its form in the shape of ashes, but so insecurely as to be easily crumbled away.

Q. In what proportion do these two constituents of bone exist?

A. About one-third of Organic and two-thirds of Inorganic matter.

Q. Are these proportions always the same?

A. No. In *Childhood* the proportions are about *equal*. In *Adult life* there is about *one-fourth of Organic* and *three-fourths of Inorganic;* and in *Old Age* there is about *one eighth of Organic* and *seven-eighths of Inorganic* matter.

Q. Why is it that it so frequently happens if aged persons fall they break a bone, while a child may fall many times with no misfortune of this kind?

A. It has been ascribed to the different proportions of animal and earthy matter existing in the bones at different periods of life.

Q. What bones of the head are of especial interest to the Dental Student?

A. The Superior maxillary or upper jaw bones; the Inferior maxillary or lower jaw bones, and the Palate bone.

Q. Why are the terms Superior and Inferior used to designate the Upper and Lower jaw bones.

A. Because Superior in Latin signifies *being above* and Inferior *being below or underneath.*

Q. Why is the Inferior maxillary called the lower jaw *bones,* when to all appearances it seems to be but one bone?

A. Because it is developed in two pieces and united in early life by cartilage at the median line, which ossifies in after life, making it appear as one bone.

Q. Can you give a general description of the Superior Maxillary Bones?

A. They are very irregular in shape. They occupy the front and upper part of the face. The two bones, the right and left half, are united at the median line. They are the largest bones of the face except the Inferior Maxillary. They enter partly into the formation of three cavities—viz: the eyes, the nose and the mouth.

Q. What other cavities or depressions do you observe in these bones?

A. One of the principal are the Alveolar Processes—with the cavities or sockets for the teeth. Also the Cavity of the Antrum or Highmore.

Q. Why is this part of the bones called the "Alveolar Process?"

A. Because a *Process* means a protuberance, a projection, or an eminence, and Alveolar means a small hollow—Alveolar Process means therefore the eminence in the bone made for the accommodation of the hollows or sockets of the roots of the teeth.

Q. What is the Cavity of the Antrum?

A. It is a cavity in the upper jaw bones above the back teeth. It is generally bounded towards the front of the socket of the eye tooth and on the back by the tubursity of the bone. It is somewhat triangular in shape—the upper border being formed by the orbit and the lower by the alveoli of the teeth—the roots of the second bicuspid and first molar teeth sometimes project into this cavity. It has no regularly defined shape, and the shape of the left and right sinus is often quite different. It has an outlet into the nares.

Q. By what other name besides the "Antrum Highmorianum" is it known?

A. By the Maxillary Sinus.

Q. Why is it called the Maxillary Sinus?

A. Because the word Sinus means a hollow or cavity, and as this cavity is in the maxillary bone, it is called the "Maxillary Sinus."

Q. Why is it called the "Antrum Highmorianum?"

A. Because the word Antrum means a cavern, and because Nathaniel Highmore many years ago gave a description of this cavern. He laid no claim to its discovery, as it had previously been described by Cassorius, yet the cavity still goes by the name of the cavern or Antrum of Highmore.

CLOSE JOINTS.

BY THEODORE F. CHUPEIN.

Vulcanite is probably one of the most insinuating substances we,

as dentists, use. It must be closely related to "Paul Pry," who though he always "hoped he did not intrude" was always intruding. So is it with Vulcanite; despite the utmost care, it will poke itself where it is not wanted and makes an ugly blemish between the joints of the gum sections we use in our dentures. It is our custom before filling the impression in a partial denture, to put pins into the depression of each tooth, by way of strengthening the teeth on the plaster model. Before such cases are flasked we cut off the plaster teeth from the model and then withdraw the pins. After such cases are vulcanized, we have seen the vulcanite *forced into all of these pin holes their entire length*, showing how the rubber will insinuate itself.

For preventing this, many suggestions have been offered, but none are so effective as to secure absolutely close joints. Dr. How, in the *Dental Cosmos* for July, offers some valuable suggestions on flasking vulcanite cases, as well as making close joints. On the former subject he recommends *a groove* in the plaster investment around the entire circumference of the invested denture *in that part of the flask containing the model*, instead of the radical gates which are most generally used for the escape of the surplus rubber.

For making close joints he says: "An excellent method for making close joints is to grind the section sides to fit squarely in front and bevel slightly half-way to the front from behind until they are nearly in the exact relations desired. Then, while still in the wax, press the edge of a knife blade into the joint to separate the section evenly a very little distance. A thin diamond disk rapidly revolved in the dental engine hand-piece may then be steadily passed dry through the joint and simultaneously cut both section sides true and parallel, so that a square tight joint along the gum faces of the sections will be insured. In fact, a large diamond disk jointer will be found to be of great value in the laboratory."

Besides this close jointing, he recommends the use of Zinc Phosphate Cement over the joints. We have used this ourselves, but not always successfully in keeping out the insidious rubber, despite of close joints.

Before flasking we fill the cement over the joints mixed thin, letting it come over the teeth as well, and over this we lay a piece of moderately thick tin foil in a strip about a quarter of an inch wide, and when the case is flasked we put the cement on the inside, commencing at the joint near the pins and bringing it upward, until it unites with that which was placed on the outside before flasking. This is likewise covered with a strip of tin foil, so as to use every effort to exclude the vulcanite from the joints.

CAMPHO PHENIQUE.

This combination is obtaining a wide repute for its many servicable uses, nearly all experimenters with it giving it credit for its services rendered. Dr. J. Foster Flagg, writing on it in *The Cosmos*, details its many uses, qualities and advantages: "It is a notable germicide, an efficient antiseptic, a non-irritant, a decided local anæsthetic, non-poisonous, insoluble in water or glycerine, does not discolor or stain, is possessed of an agreeable odor and not disagreeable taste, and maintains an unchanged integrity. * * * * * *

"In cases of pulp irritation, even of severe grade, its application upon cotton will invariably demonstrate its high rank as a 'pain-obtundent.' In devitalization of pulps, its use as the menstruum for the arsenic and acetate of morphia in our 'devitalizing paste' seems to have already given evidence of its value as a local anæsthetic in that connection. As a disinfectant of tissue surrounding pulp cavities and canals which have contained putrescent pulps, it has made an excellent record, and has proven itself, by its variety of peculiar acceptable attributes to be one of the very best applications we have ever had for the purpose.

"As a medicament, or ingredient of medicaments, for canal-dressings, either temporary or *permanent*, upon cotton, its combined characteristics of *antisepsis* and *insolubility* must command favorable recognition.

"As an antiphlogistic in the earlier stages of sthenic pericementitis, applied to the gum with small pads of muslin and renewed with *only desirable infrequency*, it has ofttimes been able to produce the attempted resolution; and, in cases where this was found impossible, to largely mitigate the suffering attending the induction of suppuration.

"As an antipyogenic, used by injection into fistulæ, either in full strength or diluted by fluid or viscid cosmoline or lanolin, it has produced eminently satisfactory results in some markedly discouraging cases." * * * * * *

PREPARATION OF ROOTS FOR CROWNS.

We give a suggestion we have seen lately to prepare roots for crowning. It is to drill the face of the root to a slight depth with a very small spear drill at close intervals around the entire circumference of the root, at the junction of the enamel with the dentine. This materi-

ally assists in the operation of pulling off the enamel, or of crushing down that tissue so as to obtain a parallel form to the root end.

ED.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The sixth annual session of the National Association of Dental Faculties was held in the Town Hall, Saratoga Springs, N. Y., commencing Monday, August 5, 1889, at 10 A. M.

The Executive Committee reported that credentials had been received in accordance with the resolution adopted last year from the following colleges :

Chicago College of Dental Surgery, Truman W. Brophy.
Indiana Dental College. J. E. Cravens.
State University of Iowa, Dental Department, A. O. Hunt.
New York College of Denistry, Frank Abbott.
Boston Dental College, J. A. Follett.
Harvard University, Dental Department, T. H. Chandler.
Ohio College of Dental Surgery, H. A. Smith.
University of Pennsylvania, Dental Department, James Truman.
Baltimore College of Dental Surgery, R. B. Winder.
Dental Department of Southern Medical College, L. D. Carpenter,
Vanderbilt University, Dental Department, W. H. Morgan.
University Dental College, J. S. Marshall.
Missouri Dental College, W. H. Eames.
Kansas City Dental College, J. D. Patterson.
Dental College of University of Michigan, J. Taft.

Subsequently credentials were received from Pennsylvania College of Dental Surgery, represented by C. N. Pierce ; Harvard University, Dental Department, Thos. Fillebrown ; and Louisville College of Dentistry, J. Lewis Howe.

Columbian University, Dental Department, represented by J. Hall Lewis, and University of Maryland, F. J. S. Gorgas, were elected members of the association. The application for membership of Royal College of Dental Surgeons of Ontario was reported favorably, but the Executive Committee expressed a doubt as to the propriety of admitting it, owing to the title of the association, which would seem to confine membership to colleges in the United States.

Applications from American College of Dental Surgeons, Chicago, College of Dental Surgery of the University of Denver, and College of Dentistry, Department of Medicine, University of Minnesota, were laid over one year under the rules.

After a long discussion, the association adopted by a vote of twelve to six, a rule requiring attendance upon three full regular courses in separate years before examination for graduation. By a vote of eighteen to one, the length of the regular courses was made "not less than five months each."

The time when the new rules shall go into effect was, on motion of Dr. Truman, fixed at the beginning of the session of 1891-92. It was also ordered, on motion of Dr. Patterson, that the resolutions requiring attendance on three terms be published in the announcements of the various colleges for the session of 1890-91.

A committee, consisting of Drs. Truman, Taft, Cravens, Brophy and Howe, was appointed to take into consideration the equalization of college fees. The committee subsequently reported a partial tabulation of fees, with a recommendation that the minimum fees be fixed at $100 a year. The report was laid over under the rules and the committee continued.

Drs. Cravens, Marshall and Patterson were appointed a committee to codify the rules and report next year.

Dr. Fillebrown, from the committee appointed to consider the request of the Baltimore College of Dental Surgery with reference to the granting of the degree of D.D.S. to a prominent practitioner without attendance upon lectures, reported in favor of declining the request. The report was accepted.

On motion of Dr. Gorgas, amended by Dr. Brophy, it was ordered that the colleges of this association print the list of their matriculates at the previous session, with the States or countries from which they come, in their annual announcement, with an asterisk (*) opposite the names of those not in attendance and a foot-note stating the fact.

On motion of Dr. Truman, it was ordered that the colleges making application for membership be notified by the secretary that it will be necessary for them to appear by representative before the Executive Committee.

Dr. Marshall offered the following, which was adopted:

Resolved, That all applications for membership reported upon favorably by the Executive Committee shall lie over one year before final action may be taken thereon.

Dr. Abbott offered a resolution requiring colleges of this association desiring to confer the honorary degree, to submit the names of the persons so to be honored, to this association for approval. Adopted.

The Committee on Text-Books reported that the work recently

published by Dr. Fillebrown had not been submitted to the committee for approval. The report was accepted.

The committee also reported that they had examined the work on "Orthodontia," compiled by Dr. S. H. Guilford, and they recommended that it be adopted as a text-book. The report was accepted.

On motion of Dr. Truman, the work on "Dental Chemistry," by Dr. Clifford Mitchell, was formally accepted as a text-book.

The following resolutions were laid over under the rules:

Offered by Dr. Brophy:

Resolved, That graduates in medicine who have not had at least two years' practice in operative and prosthetic dentistry shall be required to attend the lectures and engage in the practice-work in these departments during two annual sessions previous to admission to the examinations for the dental degree.

Offered by Dr. Patterson:

Resolved, That after the session of 1891-92 a diploma from a reputable medical college shall entitle its holder to enter the second course in dental colleges of this association, but shall not entitle him to an entrance into the senior class.

The following officers were elected for the ensuing year:

James Truman, President; L. D. Carpenter, Vice President; J. E. Cravens, Secretary; A. W. Harlan, Treasurer; Frank Abbott, J. Taft and F. J. S. Gorgas, Executive Committee.

The following committees were appointed: *Ad interim* committee, Drs. T. W. Brophy, R. B. Winder and J. A. Follett; Committee on Schools, Drs. H. A. Smith, J. D. Patterson, J. Lewis Howe, W. H. Morgan, W. H. Eames.

Adjourned to meet at the call of the Executive Committee.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The National Association of Dental Examiners held its eighth annual session in the Town Hall, Saratoga Springs, N. Y., commencing Tuesday, Aug. 6, 1889, at 1 o'clock P. M.

The following State boards of examiners were represented: Illinois, by C. R. E. Koch; Ohio, J. Taft, H. A. Smith; New Jersey, F. A. Levy, J. G. Palmer; Indiana, S. T. Kirk; Maryland, T. S. Waters; Massachusetts, L. D. Shepard, J. S. Hurlbut; Vermont, George H. Swift, James Lewis; Delaware, C. R. Jefferis, T. H. Gilpin; Colorado, P. T. Smith; Georgia, A. G. Bouton.

Delaware and California were admitted to membership.

Drs. Jefferis, Shepard and Koch were appointed a committee to consider a mass of correspondence with reference to the standing of a college whose name had been omitted from the list of colleges, whose diplomas were recommended to be received by the State boards. This committee was afterwards constituted the Committee on Colleges.

The committee at a later session reported, recommending that the secretary be instructed to inform the Dental Department of St. Louis College of Physicians and Surgeons, that owing to insufficient information the association is unable to take final action on its application for recognition; and sustaining the action of the officers in omitting the name of the University of Maryland, Dental Department, from the printed list of recognized colleges last year. The report was received and adopted unanimously.

The committee also reported the following list of colleges which may be recommended as reputable by this association:

American College of Dental Surgery, Chicago, Ill.

Baltimore College of Dental Surgery, Baltimore, Md.

Boston Dental College, Boston, Mass.

Chicago College of Dental Surgery, Chicago, Ill.

College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.

Dental Department, Columbian University, Washington, D. C.

Dental Department of Northwestern University, Chicago, Ill.

Dental Department of Southern Medical College, Atlanta, Ga.

Dental Department of University of Tennessee, Nashville, Tenn.

Harvard University, Dental Department, Cambridge, Mass.

Indiana Dental College, Indianapolis, Ind.

Kansas City Dental College, Kansas City, Mo.

Louisville College of Dentistry, Louisville, Ky.

Minnesota Hospital College, Dental Department, Minneapolis, Minn. (Defunct.)

Missouri Dental College, St. Louis, Mo.

New York College of Dentistry, New York City.

Ohio College of Dental Surgery, Cincinnati, O.

Pennsylvania College of Dental Surgery, Philadelphia, Pa.

Philadelphia Dental College, Philadelphia, Pa.

School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

St. Paul Medical College, Dental Department, St. Paul, Minn. (Defunct.)

University of California, Dental Department, San Francisco, Cal.
Northwestern College of Dental Surgery, Chicago, Ill. (Defunct.)
University of Iowa, Dental Department, Iowa City, Ia.
University of Maryland, Dental Department, Baltimore, Md.
University of Michigan, Dental Department, Ann Arbor, Mich.
University of Pennsylvania, Dental Department, Philadelphia, Pa.
Vanderbilt University, Dental Department, Nashville, Tenn.

The committee recommended also that the Standing Committee on Colleges be instructed hereafter to take cognizance of and investigate all charges against any college, that they give the accused an opportunity for defense, and that they report a revised list of colleges at each annual meeting after having investigated all complaints; and that this same committee also have authority to inquire into the proper equipment and organization of colleges not now on our list, so that they may be able to report as to the capability of such institutions to give acceptable instruction, both as to the quality and quantity of its teaching.

After hearing the representative of the College of Dental Surgery of the University of Denver, Dr. P. T. Smith, that institution was added to the list, and the report was then adopted.

Dr. Koch offered resolutions that it is the sense of this association that no one should be permitted to assume the responsibilities of a dental practitioner until he shall have had at least three years' previous study and instruction, inclusive of three full terms of not less than five months each, in a properly organized and equipped dental college, provided that time spent in the study of medicine or graduation from a medical college may be credited on this requirement not to exceed the period of two years or two full terms of collegiate instruction, and recommending to such State boards of dental examiners, as are by the laws of their respective States required to issue licenses to practice dentistry, to all holders of diplomas from reputable dental colleges that they make such rules as shall require all colleges to make three full calendar years of study, and the attendance upon three full college terms of not less that five months each a prerequisite to graduation; and that only such colleges as shall comply with this rule on or before the beginning of their scholastic year of 1890-91 should thereafter be considered as reputable; and that all State boards should, when their State laws permit the same, decline to grant a license to practice to any one who cannot produce evidence showing that he has spent at least three full years in study and preparation before attempting to assume the responsibilities of a dental practitioner.

Referred to a committee consisting of Drs. Kirk, Palmer, and Bouton, with the information that the National Association of Dental Faculties had adopted a rule to go into effect at the session of 1891-92 requiring attendance upon three full regular courses before examination for graduation. The committee reported recommending that the portion "relating to States where an examination is held and license granted be approved." The report was adopted.

Dr. Koch moved that the secretary be instructed to publish a notice in the dental journals, informing all dental colleges not now recognized as reputable by this association, that in order to be enrolled upon the list of colleges recognized by it it will be necessary for such colleges to apply for recognition and show that their workings are such as to entitle them thereto. So ordered.

Dr. Shepard moved to make the Standing Committee on Colleges consist of five members, whose duty it shall be to report annually upon the colleges entitled to recognition. So ordered.

The following officers were elected: T. S. Waters, Baltimore, President; C. R. E. Koch, Chicago, Vice President; F. A. Levy, Orange, N. J., Secretary-Treasurer. The President appointed as the Committee on List of Reputable Dental Colleges, Drs. L. D. Shepard, C. R. E. Koch, C. R. Jefferis, F. A. Levy, and S. T. Kirk.

Adjourned to meet at the time and place of the next meeting of the American Dental Association, at 9 A. M. of the first day.

COCAINE IN DEVITALIZING PULPS.

DEAR ITEMS: I see frequent remarks on the subject of the devitalization of dental pulps, but I see no item that mentions the use of cocaine for that purpose. I seldom use nerve paste, and then only in cases of congestion.

I put on the rubber dam and then use pure crystals of mur. cocaine with just water enough to moisten the cocaine, and after ten minutes I remove the live nerve with less time than with nerve paste.

I seldom find it necessary to destroy the nerve, except in crown work, or when the nerve is badly diseased.—*G. H. Collins, Lincoln, Neb.*

THE

Dental Office and Laboratory.

FOURTH SERIES.

Vol. 4. PHILADELPHIA, JANUARY, 1890. No. 1.

THE DENTAL LABORATORY.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

(Concluded from Page 173. Vol. 3. No. 6.

For many years the only means of soldering was by the aid of the mouth blowpipe. This was considerable labor. The self-acting blowpipe was considered quite an aid in the work; but the aid lay more in heating up the work; for with it, no pointing of the blaze could be done. Just as much could be effected, and effected better, by gathering a few pieces of ignited charcoal in a soldering pan or furnace, such as is shown at page 93 of No. 4, Vol. 2, of these papers (though such an appliance was not for sale at the depots at the time to which I refer, and each dentist had to have a pan or holder made at the tinsmith's, according to his own ideas) and on these laying the invested work. After which more charcoal was filled in all around the work, and this was fanned until all was a glowing mass. To some extent the same manner of procedure is observed at present, although the operation of soldering is not attended with the labor that it was then.

We propose in this paper to describe the construction of a serviceable blowpipe and bellows to be used with it. To those who can afford it we would say *purchase one*; but to the young dentist, fresh from graduation, who will doubtless have much spare time on his hands, he may be able to make one from our description for, perhaps, one-third the money it will cost to purchase.

Procure two boards of any kind of hard wood,—black walnut will answer well. The boards should be 10 x 11 inches in measurement, and $\frac{7}{8}$ of an inch thick. Both these boards are rounded on one end as shown in Fig. 68. In the board A a hole is bored as indicated at H, over which the valve of the bellows plays. This hole should be about $1\frac{1}{2}$ inches in diameter. It is bored midway from the sides of the board, and the outer edge of the hole should be $2\frac{1}{2}$ inches from the square end. This board forms the *bottom* of the bellows. The

hole over which the valve plays, should be covered with a piece of

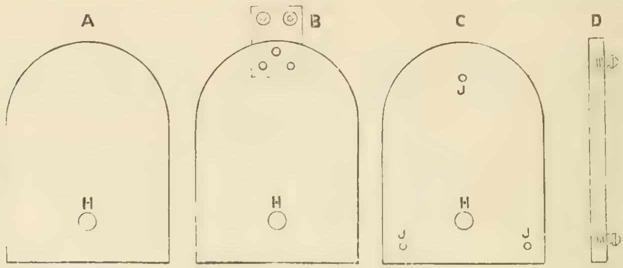

Fig. 86.

wire gauze, to prevent the admission of large particles of dirt or lint, which, without this precaution, would interfere with the working of the valve. At the rounding end of this bottom board a piece of iron 5 inches long, 3 inches wide and $\frac{1}{4}$-inch thick is screwed to it as indicated at B, Fig. 86. Two holes are made in the protruding end of this piece of iron by which it may be screwed to the floor. But if this be not desirable, and the operator wishes to have the bellows movable, so that he may use it from place to place, such a piece of iron for the bottom board is not necessary. It is important however that this bottom board be lifted a certain distance from the floor, as without this the air would not be admitted to the valve hole, and besides, such close proximity to the floor would soon fill the interior of the bellows with dust, which would be sucked in. For this purpose three large wood screws may be used. They are screwed into this bottom board a little over a half-inch (*not* sufficent to let the end of the screw perforate the board), and in the position indicated at J. J. J., Fig 86. When the screws are fixed into the board in the position indicated, they are unscrewed and a little more than a half-inch of the screw part of each screw filed off, and the head of the screw is also filed off from the shank, to the length of about $\frac{3}{4}$ of an inch. The end of the shank is then sharpened with a file (or in a lathe) to a point, and a slot cut into the shank so that a wrench may be used to put the screw back into the bottom board. The manipulation of the screw, as described, is shown in Fig. 87, and the way they appear when screwed into the bottom board is shown at D, Fig. 86. It will be seen that by these screws the bottom board of the bellows is elevated about $\frac{3}{4}$ of an inch from the floor. The object of sharpening the ends of the screws. is for the purpose of keeping the bellows from slipping when the foot is

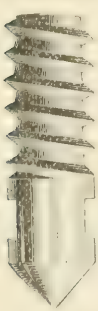

Fig. 87.

applied to the upper board. The valve consists of a piece of soft leather, to which two pieces of wood are attached. It is shown at Fig. 88. These pieces of board for the valve need not be more than ½ an inch thick. They should be glued to the leather, and they should be beveled so that the lifting part F, will have free motion over the air hole, in the bottom board. The other part of the valve board should also be beveled, and is perforated with two holes, that it may be screwed to the bottom board, as shown at E, of Fig. 88. The valve should be sufficiently large to cover the air hole in the bottom board by at least ½-inch on all sides. To make a more perfect fit of the valve over the air hole, that part of it marked F, may be weighted by screwing to it a piece of thick sheet lead with small ½-inch screws. This will be all that is needed for the bottom board.

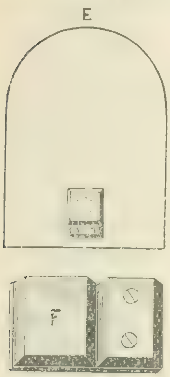

Fig. 88.

The top board is another piece exactly the same size, shape and thickness as the other, as shown at A, Fig. 89. It is perforated also with a hole about 1½ inches in diameter, as shown in the cut at K.

A circular piece of board, 9 inches in diameter and 1½ *inches* thick, is next made, as shown at C of Fig. 89. This circular piece is

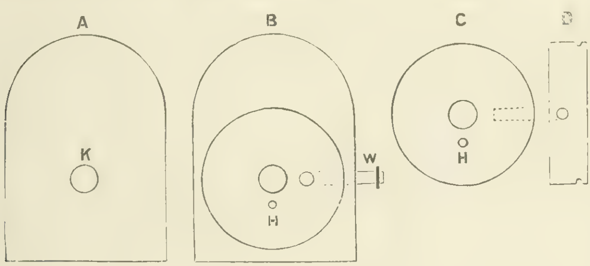

Fig. 89.

grooved deeply (preferably in a lathe) as shown at D, Fig. 89, or in the absence of a lathe, the groove may be made with a saw and wood rasp. Into the side of the circular piece a hole is bored ⅜ of an inch in diameter, as shown by dotted line at C and D, Fig. 89. The object of this hole is to accommodate a piece of brass tubing ⅜ of an inch in diameter and about 4 inches long. On this piece of brass tube a piece of brass wire may be soft soldered, on the end that protrudes from the bellows, so that the rubber tubing that fits over it, when it is in use, may hug the brass tube tighter, as shown at W of B, Fig. 89, also at

W, Fig. 96. Before driving the brass tube into this hole, another hole is bored at right angles with it, so that the two holes meet, as shown by the dotted lines at D, Fig. 89. A hole $1\frac{1}{2}$ inches in diameter is bored in the circular piece, as shown at B and C, Fig. 89 This hole should have no connection with the small hole bored in the side of the circular piece for the accommodation of the brass tube.

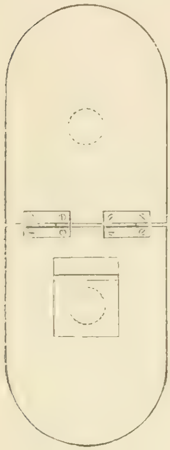

Fig. 90.

Having proceeded thus far the top and bottom boards are hinged, as shown in Fig. 90.

It will be better before making *the large hole* in the top board (shown at K in A of Fig. 89 and in B and C, Fig. 89) of the circular board to assemble these parts.

The circular board C, Fig. 89, is glued to the top board, as shown at B, Fig. 89. The large hole is then made *through both boards.* The small hole in the side of the circular board should be made *before* this is glued to the top board. The intersecting hole is likewise made through the top board until it unites or connects with the hole in the circular board.

A valve is made to fit over this large hole. This is a simple affair. It consists of a piece of soft leather, to which a piece of board is glued or tacked with small tacks. The board should be about $\frac{1}{4}$-inch thick and sufficiently large to cover the hole $\frac{1}{4}$ of an inch over its entire circumference. The leather should be sufficiently long to extend backwards so as to form a hinge. This valve lifts upwards, like the lower valve, and is shown in A, Fig. 91, as well as in Fig. 95. There is a small hole made in the circular board, shown at H of B and C, Fig. 89, that will be explained further on.

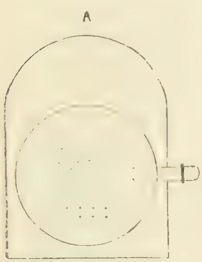

Fig. 91.

A piece of iron, 3 inches wide, $\frac{1}{4}$-inch thick and 7 inches long, is bent at right angles, something in the shape of the letter Z. This is screwed to the round end of the top board. It is for the purpose of placing the foot on when working the bellows. See Fig. 92. Two holes are made in one end of it, so as to screw it to the top board.

Fig. 92.

A bed spring is next secured to both the top and bottom boards, as shown in S, Fig. 93. As an explanation of this cut we will say G represents the iron foot piece, L the large

hole, made through both the top and circular boards, over which T, the top valve, plays. H is the small hole made in the circular board, into which the brass tube is fitted. C is the circular board, which is glued to the top board, through both of which the large hole passes, and into the side of which, H, a hole is made for the brass tube, and which is furnished with a deep groove, J. A is the top board, B the bottom board, V the lower valve, L the hole in the lower board over which the valve V plays. F F the feet (3 of them, 2 on the square and 1 on the round end of the bottom board), K a piece of iron (already described) designed to screw the bellows to the floor. If not used, the bellows should be provided with feet, F.

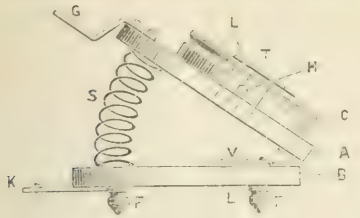

Fig. 93.

The parts being assembled as shown, a heavy piece of sheepskin, 30 inches long, 7 inches wide at its greatest diameter, and tapering 2 inches at its smallest, is used to unite the top and bottom boards of the bellows, cut in the shape as shown at Fig. 94. The spring, hinges and lower valve should be carefully secured, because once the bellows gets its covering of sheepskin, these parts are inaccessible.

To apply the sheepskin, the top and bottom boards are brought together as close as the spring will permit, and are held thus with one, two or three clamps, such as carpenters use when gluing. The sheepskin is glued and tacked to one board at a time, beginning at the square end and going all around, gluing the sheepskin and tacking it at frequent intervals as you proceed. The same procedure is observed for the other board, and an extra piece of sheepskin is glued to the hinged end for additional security against leakage. When it is all glued, a strip of leather about a half-inch wide is tacked over the sheepskin to the edges of the top and bottom boards, with small gimp tacks, for the purpose of a finish.


Fig. 94.

Before tacking down the top valve, which rests on the circular board, a small hole is drilled about $\frac{1}{4}$ of an inch in diameter (see H of B and C, Fig. 89) and a half-inch deep into the circular board, about $\frac{3}{4}$ of an inch from the outer circumference of the large

hole. The object of this hole is for the support of a delicate spiral spring which presses the top valve *upwards*, as shown in A, Fig. 95.

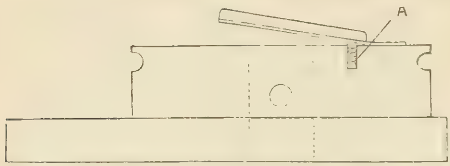

Fig. 95.

All that remains now to be done is to secure *two or three thicknesses of thick rubber dam* to the circular board. These are cut in the form of circles with enough to spare that it may be tied into the groove of the circular board. It is best to tie each piece of the dam separately, and with a slip-knot in the twine. The final operation is to tie on the *scoop net.* To do this the twine is passed *in and out* through the *lower meshes* of the net, when it is applied to the groove of the circular board and therein tied securely. The bellows when finished is represented at Fig. 96.

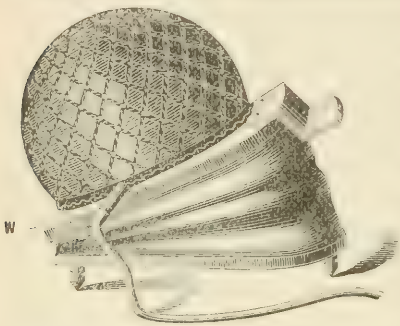

Fig. 96.

To make a gas blowpipe we proceed as follows: A piece of seamless brass tube is obtained, about $\frac{3}{8}$ of an inch in diameter. This

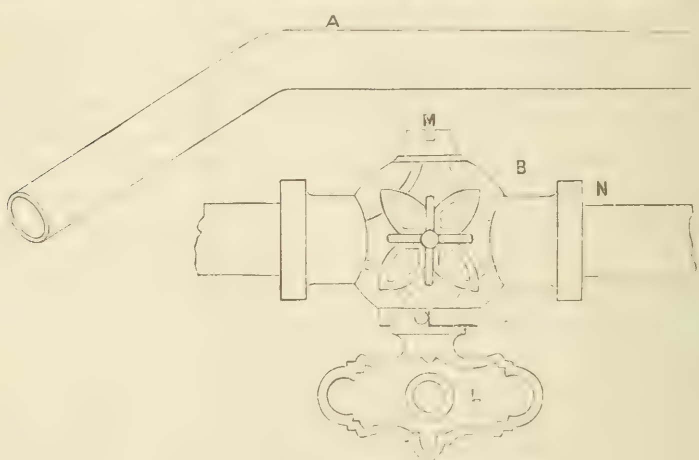

Fig. 97.

is annealed, and when cold it is bent, as shown in Fig 97. On the

other end a gas key may be soldered with silver solder, as shown at B. Fig. 97, and at K, Fig. 100. Before soldering this gas faucet the key L should be removed by taking out the screw M, which holds it in place. A short section of tube is soldered to the other end of the socket, as shown at N, Fig. 97. This key is not essential to the gas blowpipe, but it will be found very serviceable in decreasing the flow of gas when it is necessary to point the blaze. The bent end of the large tube is drilled with a small hole at the point marked A, Fig. 97. At page 41 of Vol. 3, No. 2, March, 1889, number, we gave the manner of making small tubing.

A piece of this small tubing is taken (about 3 inches of it) and where the seams of the metal come together it is carefully *hard soldered* with silver solder. The size of this tube should not exceed 3-16 of an inch in diameter. The hole drilled into the tube at A, Fig. 97, should be increased in size, with 5-sided reamers, until the small brass tube fits into it *snugly*. This small piece is then bent near the end, as shown at A, Fig. 98, and a piece of brass plate soldered to it, as shown at B, Fig. 98. To avoid repetition we will say that all the soldering is to be done with hard solder (silver solder is best used on brass) unless otherwise specified.

The small tube is then soldered to a washer, D, Fig 98, and this

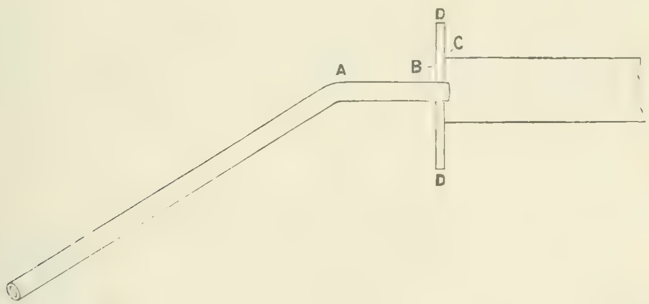

Fig. 98.

washer soldered to the large tubing, as shown at C, Fig. 98. The large tube is the same size as that shown in Fig. 97. After soldering the ends, D D, Fig. 98, may be filed off

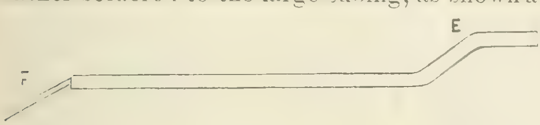

Fig. 99.

level with the large tube. The large tube, thus soldered to the small

tube, is now bent at its end, as shown at E, Fig. 99. This being done the two parts are assembled. The small tube F, of Fig. 99, is passed into the hole made for it at A, Fig. 97, and the two parts bound together with binding wire, as shown in Fig. 100. The parts which were

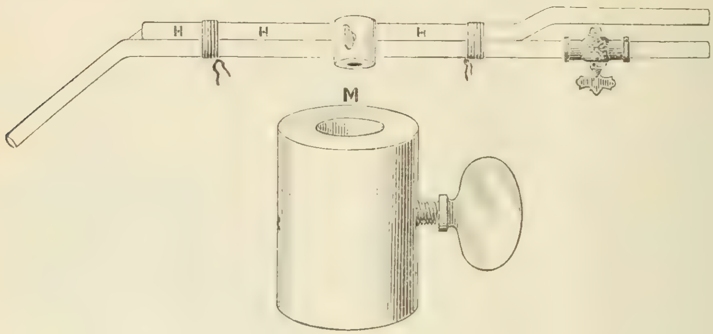

Fig. 100.

previously soldered, and the parts H H H, where the two tubes are brought close together with the binding wire, Fig. 100, are well coated with borax and water ground to a creamy consistency. These parts should be scraped clean before the tubes are bound together, after which they are soldered. The upper tube is for the air supply, the lower for the gas supply. A sectional view of the blowpipe is shown at Fig. 101. The end of the small tube, which

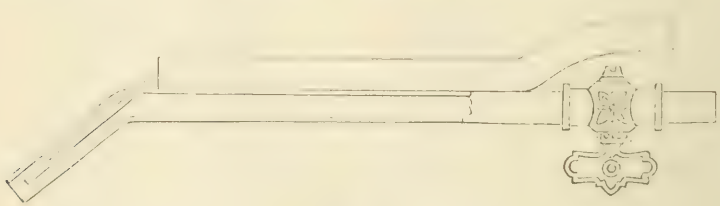

Fig. 101.

passes through the large tube, should not extend beyond it, but be a little short of it, say about 3-16 of an inch from the end.

Before removing the binding wire, shown at Fig. 100, it is desirable to solder on the blowpipe a piece of thick brass tube about an inch long and about $\frac{1}{8}$ of an inch thick, having a bore of about a half-inch. This piece of tube should be prepared, however, before it is

soldered. A hole should be drilled in the side of it, and this hole tapped with a screw thread. A thumb screw is then fitted to it. The position of this is shown at Fig. 100, and the piece of tube with the thumb screw at M of the same cut. This tube is soldered to the blowpipe by binding it in position with binding wire. The blowpipe is then finished. A standard is then made for its support. This is a simple operation. A piece of brass rod slightly smaller in diameter than the bore of the brass tube M, of Fig. 100, about twelve inches long, is used. About one inch of moulding sand is packed, moderately tight, in one of the largest of the casting rings. The brass rod is *deeply* nicked with a file, in several places, *about one inch* from one end, and this end is sunk perpendicularly into the sand of the moulding ring, and with any arrangement found available the other end is supported, so it will be perpendicular. Lead is then melted and poured into the casting ring to the depth of about $1\frac{1}{2}$ inches. When cold the protruding end of the brass (which was sunk into the moulding sand) is filed off. This makes a standard as shown in Fig. 102. The blowpipe is then passed over the standard by means of the piece of brass tube soldered to it at Fig. 100, when it may be held at any convenient height by means of the thumb screw attached to this tube. In use the air from the bellows and the gas from the burner is conveyed to it as shown in Fig. 103.

Fig. 102.

We propose now to go into the description of how to make a blowpipe furnace, as well as a larger furnace of the same kind, by aid of which small quantities of gold may be melted in the former, and zinc, lead, tin or Babbitt metal in the latter. These appliances will be found very useful in the dental laboratory. We will describe the one for melting zinc first:

Procure an old iron six-quart plaster can; see Fig. 101. Remove the cover, and have a tinman to cut it off all around about 2 inches from the top. If the can is not rivetted where the two ends of the metal meet this should be done. If it is only lapped, the lapped ends should be well hammered together, so there will be no danger of their pulling apart. A hole should also be cut in the metal about 2 inches in diameter, the center of the hole being $1\frac{1}{2}$ inches from bottom of the can, all as indicated in Fig. 104.

Equal parts of Powdered Asbestos, Kaolin Clay, and Plaster of Paris are mixed with water to the consistency of a thick Paste, and

the bottom of the can packed with this to the depth of an inch. A large bottle or jar is now procured, not less than $5\frac{1}{2}$ inches in diameter

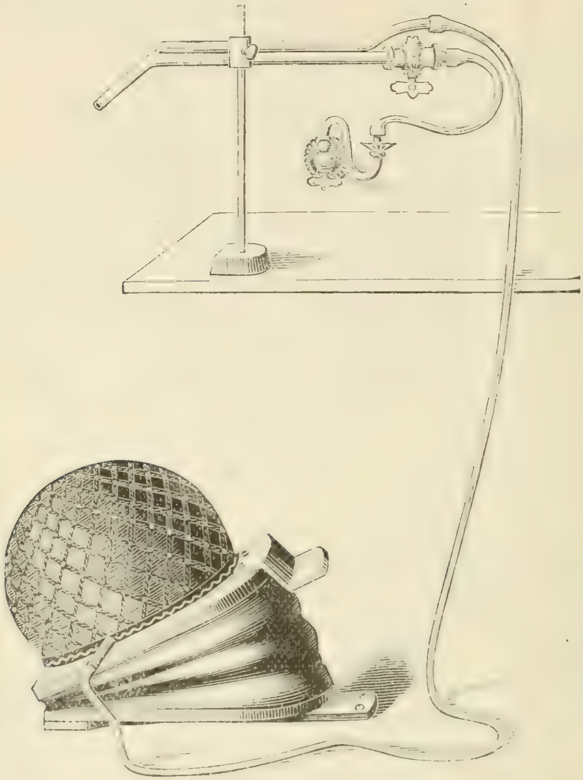

Fig. 103.

(one with the bottom receeding inwardly is preferable). The receeding part of the bottle having been oiled, is filled with the Plaster, Asbestos and Kaolin, and it is then inverted and put in the center of the can and slightly moistened so that the mixture in the can will unite with that which was put in the receeding part of the bottle. The sides of the can are then filled and packed, with the same mixture, by the aid of a stick, as shown in Fig. 105, the hole made in the side of the can being plugged with a round stick, an inch in diameter, to prevent the mixture from escaping

Fig. 104.

at this point. As the hole in the can was cut 2 inches in diameter a piece of sheet iron having a hole cut into it one inch in diameter should be placed over the plug as shown in Fig. 105. When the can is filled, the bottle or jar is loosened, and carefully withdrawn, and then the wooden plug is removed. It is well to oil the sides of the bottle to facilitate its withdrawal. Any imperfections that may exist in this luting or plastering of the can may be rectified by the addition of more material at the defective joint by means of a spatula. Should the receeding part of the bottle or jar be too high some of the material can be taken off and leveled, as shown by the line at the bottom of the can in Fig. 105. The top of the can is now filled with the same material, a stick or the large handle of an instru-

Fig. 105.

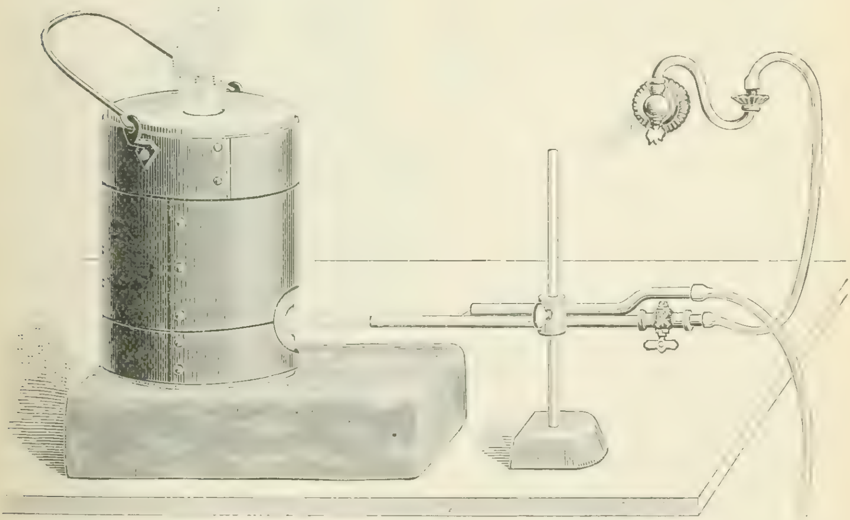

Fig. 106.

ment, about 2 inches in diameter, and tapering, being placed in the

center of the top of the can so as to form a hole in it. The melting furnace when complete is shown at Fig. 106, and Fig. 107 gives a sectional view of the same. The construction of a blowpipe furnace for melting gold is carried through in precisely the same manner, only that instead of using a plaster can, a tomato can will be found sufficiently large. Instead of being soft soldered however, the laps of the can *must be rivetted.* In mixing the Plaster, Asbestos and Kaolin, it may be well to mix it in the given proportions *several times*, as, if mixed in the quantity necessary for the whole job, it may set or harden before completion. With two furnaces such as we have given the description of, the young dentist will be well provided for doing nearly all the work that may offer where strong heat is required.

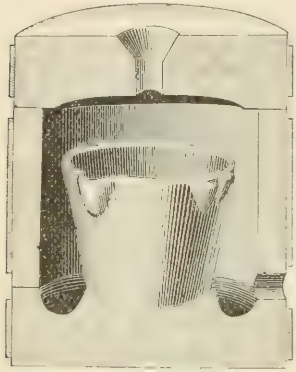

Fig. 107.

Since writing the above description of how to make a furnace, we have been experimenting on these, and we have found that in one or two points the manipulation can be improved. For instance, instead of making the furnace in two parts (as described) it is easier and better made in three parts. The can therefore should be cut as shown by the lower line in Fig. 104, and this part packed with the fire clay mixture mixed to the consistency of a thick paste. The top part, to which the handle of the can is affixed, as shown in Fig. 106, may also be filled with the material mixed to the same consistency. But the middle part, in which the jar or bottle is used to form this part into a cylinder, may be done better, as will be here described. We found that although the jar or bottle was well greased on the outside for the purpose of releasing, that it was held immovably within the cylinder, and the only way we could get it out was to break it up. We therefore devised another plan. We took a piece of sheet zinc the necessary height and bent it round, lapping the ends, and securing this of the requisite size or diameter by binding it with fine binding wire. We place this binding wire in three places, one piece at each end of the zinc roll and the other piece in the center. With this arrangement, placed within the can, we used it as a core, and packed the Asbestos, Kaolin and plaster around it, and in doing this we found that it was preferable to mix these materials to the *consistency of cream*, instead of mixing them thick as paste; for in this condition these materials could be poured between the zinc core and the can with more facility

and with fewer flaws, than it could be done in a pasty or a putty-like condition. When the material *set hard*, the edge of the roll of the zinc core was seized with a pair of large flat-nose pliers and twisted inwardly, and in this way the core released with facility.

Fig. 108.

What we mean by making the furnace in *three parts* instead of two parts will be better understood by Fig. 108. Here it will be shown that the *lower* part of the can is cut off, and this part packed as shown. The middle part is packed as described with the sheet zinc core, and the upper part or cover as described for this part.

We understand that Dr. Rosenthall, of Cincinnati, O., has devised

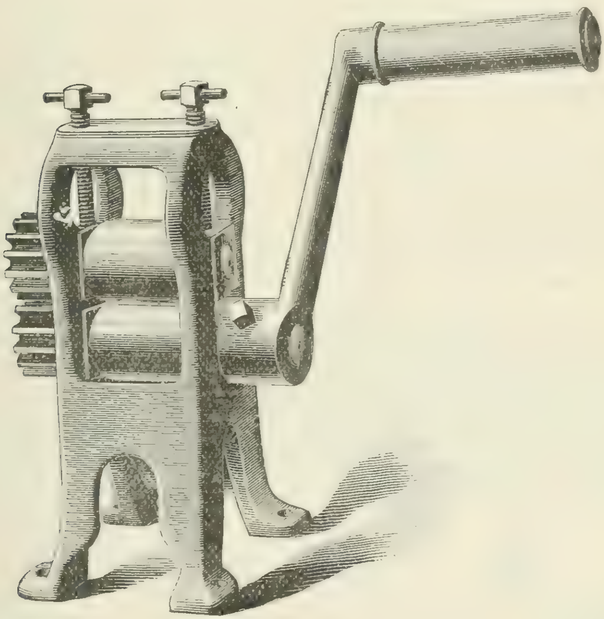

Fig. 109.

a very useful appliance for the laboratory. This consists of a "Lilliputian Rolling Mill." The rollers are two inches long and one inch

and a half in diameter. The whole weighs about twenty pounds and is set in a strong frame. It is as efficient as a large mill for working small quantities of metal, and is sold at the very reasonable price of fifteen dollars. Fig. 109 shows these rolls.

By means of the standard shown in Fig. 102 the gas blowpipe can be depressed suffieiently that the flame may play through the holes of the furnace we have described.

For this use, however, a blowpipe would have to be made with a *straight nozzle*, instead of being bent as the one is that we have described. It is well to let the Plaster, Asbestos and Kaolin dry well before using, and when first used to heat it up gradually.

REMOVABLE BRIDGEWORK.

In the march number of the Dental Cosmos for 1889 there appeared an article by Dr. H. A. Parr, of New York, on "Removable Artificial Dentures," which appeared to us as being a valuable improvement on the fixed Bridgework, which is so much in vogue at present. Apart from the great consideration of cleanliness, the strain of the denture is not borne entirely by the teeth used as buttresses, but a part of the burden is borne by the gums as well.

Having a case in which the patient was sadly in need of some antagonizing teeth, and one which seemed to indicate the employment of just such a plan as was proposed in the article by Dr. Parr, we proceeded to construct such a denture.

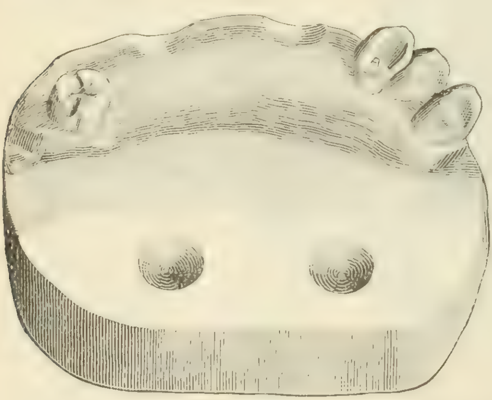

Fig. 110.

The patient had not lost any of his lower back teeth, but the space from the right upper cuspid to the 3 molar was edentulous. He had made such vigorous use of his teeth that the occlusion was so close that the thinnest tissue paper could not be placed between the occluding teeth. The incisers of the upper jaw were worn into grooves and gullies on their palatal aspects by the attrition of the lower teeth.

Fig. 110 represents a model of the case. It was useless to endeavor to cut the cuspid so as to put a gold cap over it, as the lower opposing tooth closed on it like a pair of shears. The third molar, too, was in a like dilemma.

But we propose in this to relate how we proceeded in this case from its inception to the end.

Our first procedure was to dress off the distal surface of the cuspid, near its cutting edge, as as to make the tooth as parallel as possible, and next to grind a groove on the palatal aspect of the same tooth, A, Fig. 110.


Fig. 111.

The 3d molar was likewise dressed away on its distal surface to make this tooth also of easy draft. The palatal and buccal fissures were also deepened by grinding the teeth away in these places with small corrundum wheels. The enamel was not cut through in any of the dressings made on these teeth.


Fig. 112.

Our next procedure was to take, *separately*, plaster impressions of the cuspid and 3d molar. From these impressions we made models, and from the models dies, on which we fitted and swedged very accurately, a band to encircle the molar, to which we soldered pieces of wire that fell into the grooves cut on the buccal and palatal fissures of this tooth, as shown at Fig. 111. The cuspid was fitted with a half cap, as shown at Fig. 112, a small spur being swedged down into the groove, as shown at A, Fig. 110. We next made a box of gold by bending a piece of gold plate $\frac{1}{8}$ of an inch wide, around a piece of square steel wire, as shown at Fig. 113, which we attached to the ring with hard wax. Our next procedure was to make the spring catch which was to fit into this box. This was made of a piece of springy platinized gold bent in the form of a letter U, as shown at Fig. 114. A piece of stout round gold wire was bent as shown at Fig. 115, and so filed that one end would fit over the spring catch, Fig. 114, to which it was wired and soldered, as shown at Fig. 116. It was now tried into the box which had been fastened to the collar around the molar, Fig. 117, while the other end was filed until it fitted well on to the half collar on the cuspid tooth, Fig. 112.


Fig. 113.


Fig. 114.

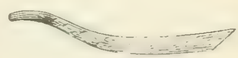
Fig. 115.

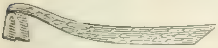
Fig. 116.

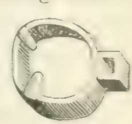
Fig. 117.

This end was then fastened to this collar with adhesive wax, when it was invested and soldered, as shown in Fig. 118. Before these manipulations were begun the teeth had been ground, fitted and articulated, as shown in Fig. 119. The object of this being to determine where to solder the box on the

Fig. 118.

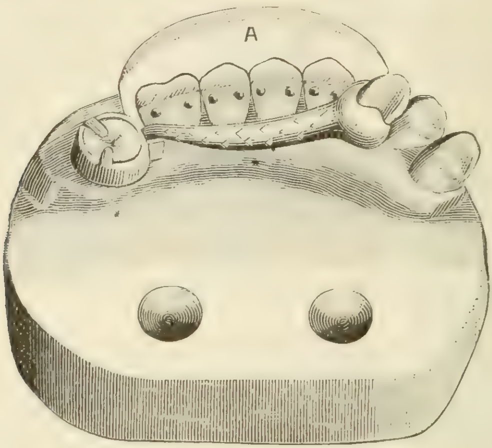

Fig. 119.

collar on the molar tooth. The box on the molar was invested and soldered to the collar, Fig. 117. Molar teeth and bicuspids were found to be too thick, so that cuspids were used in place of bicuspids, and a facing molar, with long pins, was used for the molar teeth. The teeth were held in position while the gold work was being prepared by casting a plaster matrix on the front faces of the teeth,as shown at A, Fig. 119. The gold work being all prepared, the case was waxed up, flasked and vulcanized.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

(Continued.)

Q. With what bones are the superior maxillary connected?

A. With the Frontal and Ethmoid bones of the cranium, and with the Nasal, Malar, Lachrymal, Palate, Inferior turbinated, Vomer and its fellows, by sutures.

Q. Why is it called the Frontal bone?

A. Because it is the bone of the forehead, the name signifying forehead.

Q. Why is the next bone you have mentioned called Ethmoid?

A. Because Ethmoid means "resembling a sieve," the bone being porous and preforated with many holes for the passage of the olfactory nerves.

Q. Why is the next bone called the Nasal bone?

A. Because the word signifies, as pertaining to the nose.

Q. And why the Malar bone?

A. Because "Mala" in Latin signifies "the cheek," this bone being the cheek bone.

Q. What can you tell about the Lachrymal bone?

A. It is a bone shaped somewhat like a finger nail. It probably derives its name from being the location of the lachrymal or tear sack, as well as assisting the formation of the lachrymal tube or duct.

Q. What about the Palate bone?

A. The Palate bone is so named because it was supposed that the integument that covered it was the seat of the nerves of taste. Its general form is that of the letter L.

Q What is the origin of the name turbinated. as applied to this bone ?

A. Turbinate signifies to twist or turn round like a top, and as the bone assumes the form of a scroll, the curl or twist in its shape may have given rise to its name.

Q. Can you tell anything about the Vomer?

A. The Vomer is a slender, thin bone separating the nostrils from each other, consisting of two united plates. It is in form like a ploughshare.

Q. How many bones do we find in the head and face?

A. There are 22 bones. 8 in the head or skull and 14 in the face.

Q. Can you name them?

A. *One* Occipital, *two* Temporal, *one* Sphenoid, *two* Parietal, *one* Frontal, *one* Ethmoid, *one* Vomer, *two* Superior Maxillary, *one* Inferior Maxillary, *two* Palate, *two* Turbinated, *two* Lachrymal, *two* Nasal, *two* Malar bones.

Q. What principal parts do we find in the Inferior Maxillary Bone?

A. The Body, the Angle, the Ramus, the Symphasis. the Coronoid process, the Condoyle, the Sigmoid notch, the Alveolar process, the Foramen, Mental and the Internal Dental Foramen.

Q. What principal parts do we find in the Superior Maxillary bone?

A. The Body, the Orbital Surface, the Facial Surface, the Infra-

orbital Canal, the Zygomatic Surface, the Maxillary tuberosity, the Incisive fossa, the Alveolar process, the Malar process, the Nasal spine, the Antrum of Highmore, the Palate process.

Q. How many teeth do we find in the human subject?

A. Twenty, and thirty-two. Twenty in the infant, thirty-two in more advanced life.

Q. By what name is the first teeth of the infant called?

A. Temporary, Deciduous, or Milk teeth.

Q. How are these classified?

A. Into Incisors, Cuspids and Molars. 8 incisors, 4 cuspids and 8 molars.

Q. At what time of life do we generally find these teeth to errupt?

A. The central incisors between the 5th and 8th month.
The lateral incisors " " 7th " 10th "
The canines " " 12th " 16th "
The 1st molars " " 14th " 20th "
The 2d molars " " 20th " 36th "

Q. And how many teeth do we find in the man?

A. Thirty-two—16 in each jaw.

Q. How are these classified?

A. Into Incisors, Cuspids, Bicuspids and Molars.

Q. How many of each class do we find?

A. 8 Incisors, 4 Cuspids, 8 Bicuspids, and 12 Molars.

Q. At what age do these errupt?

A. The 4 1st molars about the 6th year.
The 4 central incisors about the 7th year.
The 4 lateral " " " 8th "
The 4 1st bicuspids about the 9th year.
The 4 2d bicuspids about the 10th year.
The 4 cuspids " " 12th "
The 4 2d molars " " 13th "
The 4 Wisdom teeth " " 18th "

Q. How are the teeth named?

A. From their *office* or *form*. Thus the Incisors, as the word implies for cutting the food, the Cuspids from their form, cuspis signifying a *point* or *spear*, the Bicuspids from their form—Bi or Bis signify two or twice, two points—molars from their office, "Molaris" signifying "grinding."

Q. Into how many parts is a tooth divided?

A. Into three parts, *the crown*, *the neck* and *the root*. The crown is all that part of the tooth exposed above the gum, the neck is the con-

structed part above the crown, the root is all that part which is buried in the alveolus or socket.

Q. How many structures do we find in a tooth?

A. Four; the pulp, the dentine, the cementum and the enamel.

Q. Where in the tooth are these structures found?

A. The *Pulp* occupies the central part of the tooth, which is surrounded by the *Dentine.* The *Enamel* covers the dentine at its exposed point outside the gum. The *Cementum* covers the dentine on the inside of the root within the alveolus.

Q. Is the Pulp entirely encased in the tooth?

A. No. There is an outlet at the end of the root called the foramen, or dental foramen, through which blood vessels and nerves pass to supply the tooth with nourishment.

Q. What is the Enamel?

A. It is the hard white covering of the crown of the tooth. It is the hardest of all animal tissues. It is devoid of sensibility. It is made up of hexagonal prisms or rods, which are set up on end and rest against the dentine. It is very brittle. It cleaves best in the direction of its rods.

Q. What is the Dentine?

A. It is the largest tissue of the tooth. It is called sometimes "the ivory of the tooth." It is deeper in color than the enamel. It is covered by the enamel on the crown and by the cementum on the root of the tooth, and in its turn covers the pulp. It is supposed to contain an infinite number of minute tubes, each of which is filled with fibrillæ, which communicate with or establish a communication with the pulp. It is highly organic, and invested with great sensitiveness.

Q. What is the Cementum?

A. It is the covering of the root of the tooth. It is thickest near the end of the root. It slightly overlaps the enamel of the crown. It is the most highly organized tissue of the tooth, and approaches the character of bone in its formation, being filled with canaliculi, lacunæ and Haversian canals. A circulation is supposed to be established within it, by which a devitalized tooth is retained or tolerated in the alveolus. From the effect of extreme irritation of the peridental membrane, which covers the cementum, this tissue at times becomes hypertrophoid, causing what is known as "dental exostosis" to result. It is highly sensitive when exposed by the recession of the gum.

Q. You used the word hypertrophoid; what do you mean by hypertrophy?

A. It means an increase in bulk. It is the state of an organ or part in which, from increased nourishment, its bulk is augmented.

Q. What is supposed to be the cause of the pain which is experienced when the dentine is cut or drilled?

A. It is believed that in cutting, burring, drilling or filing the dentine, the fibrillæ which permeates this tissue through the dentinal tubulæ, are cut or stretched by the instrument used, and these communicating with the pulp, establish the circuit of sensibility to that organ and through it to the brain.

Q. It would seem that the same pain might be induced from the excessive wearing away of the tooth by constant chewing, as in the habit of tobacco chewers?

A. A provision to meet such cases is established by Nature in the formation of secondary dentine, at points where the pulp or nerve would become actually exposed from the attrition incident to constant chewing. Besides, the pulp is constantly shrinking in size within the tooth, compensating, in a great measure, by its decrease in size for the gradual wear. The irritation to the dentine doubtless sets up a species of hypertrophy, which perhaps fills up the dental tubulæ with bony deposit, thereby preventing pain.

FITTING THE MEANS TO THE ENDS, OR EXTRACTING A ROOT WITH A WOOD SCREW.

By Theodore F. Chupein, D.D.S.

Having lately had rather a stubborn customer to deal with, in the shape of an upper bicuspid root, we propose to relate how we accomplished its removal with a small wood screw, when all our efforts with the forceps failed.

The root was almost covered by the gum, and although we took the precaution of passing a gum lancet entirely around the root, so that there would be no impediments to the insinuation of the beaks of the forceps, still there was so little sound substance on the root to grasp that the forceps kept chipping off pieces of the root at each effort at extraction, besides inflicting considerable pain. Feeling sure that we would fail with these efforts, we searched for the nerve canal with a probe. This being found, we gradually increased its size with different sized spear drills in the dental engine, after which we introduced a small screw into the enlarged canal by holding this within the beaks of a pair of incisor forceps. When the screw was well inserted into the root,

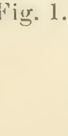

Fig. 1.

we seized the head of the screw with the same pair of forceps, when the root came away with little effort or force. Fig. 1 illustrates the screw inserted into the root.

THE PRACTICAL PLACE.

Before setting crowns wipe the gum around the root with a solution of perchloride of iron, which will prevent weeping, and the most important part of the cement will be protected until crystallized.—*Dr. L. E. Custer.*

THE SALE OF PRACTICES.—The French courts have decided that a physician cannot legally sell his practice, on the ground that a medical practice is not an article of commerce. A contract to abstain from practicing in any given neighborhood is, however, valid, and to be capable of enforcement at law.

FILING GLASS.—The *Pharmaceutische Centralhalle* states that glass may be filed easily and without danger of breaking by dipping the file into strong soda lye, and then, while still wet, into coarse sand.

To avoid displacement of small pieces in soldering, by the frothing of borax, rub up with your flux and water on your slate a minute quantity of gum arabic.—*Carl J. Gramm, in Archives.*

SECOND SOLDERING.—When it is desired to solder a piece that has been soldered in another place, most gold workers consider it necessary to use a softer solder, which shall flow at a lower temperature than that first used, that the unsoldering of the previous work may be avoided. This is needless, if the solder used in the second case be placed in mercury until the surface is slightly amalgamated. If it be then used it will flow very readily, while the appearance of the finished piece is not injured, as the mercury is sublimated in the heating, leaving the solder as it originally was.—*Barrett.*

The men who invent are thinkers; they are persons of adaptation and consecration; they are, and have been, benefactors to their brethren, and, as a rule, they suggest and give away to their co-workers little suggestions without money and without price, to make dental operations easy, more than all the money they receive for their patents. Inventions are the products of the brain, and they are just as

legitimate as the labor of the hands. A certain orator was once asked how long it had taken him to prepare his oration ; he replied, "just forty-four years, for I am just forty-four years old, and I have given my whole life to this work."—*Dr. J. A. Robinson, in Archives.*

To prepare cores for undercuts of models, when making dies, a good method consists in thoroughly mixing common flour in the proportion of about 10 per cent. to 90 per cent. of molding sand ; or, what is better, marble dust. This is first mixed dry, and then, on being moistened with water somewhat more freely than the sand alone is moistened, placed into the undercuts, and while the model is being prepared the paste has sufficiently hardened to be gently removed and placed in an oven, or otherwise exposed to gentle heat. When these cores are dry they can be safely handled, and on withdrawing the model they can be readily replaced in their position.—*Dental Review.*

To Obtund Pain.—There is one method of producing insensibility to pain which I would like to mention, and one which I sometimes use. On the battle-field during the late unpleasantness we had many demonstrations of its value. How many men on the battle-field did not know they were hit with a bullet, while making a charge of a quarter of a mile on a fast run, until the trickling of the blood and their weakness brought them to the ground? I refer to rapid breathing. Try it. You will be able to extract teeth without pain to your patients.—*Dr. Story in Amer. Asso.*

"If any one really wishes to raise a toothache that shall cause him to be remembered, let him put arsenical paste in a wet cavity, the pulp being covered with refuse matter and decayed dentine, and then let him cap the climax of the outrage by thrusting into the outer cavity cotton wet with a sandarach solution. This will permeate the whole cavity, encapsule the arsenical paste, and prevent its action, while it serves as a constant irritant. In a few hours it will decompose, and the cavity will become foul almost beyond conception. We think it is really the worst covering for a temporary dressing of which we have any knowledge, and we have had experience enough with it to be an expert in judging its demerits."—*Dr. W. C. Barrett.*

Pertinent Questions.—Is it justifiable to cut off and crown an incisor that could be made to do service for years on account of the unsightliness of a large contour filling?

In narrow lateral incisors, is the treatment of the pulp justifiable to insure stability of the filling?

With a full complement of teeth, should there ever be an endeavor to save aching third molars?

In bridge-work, is a span of over four teeth a safe operation?

Is it right to remove cotton from the roots of pulpless teeth that have been filled for over five years and have never given any trouble?

ABOUT THE WAY MOST OF 'EM FEEL.—" Young man, I am a physician, and therefore have neither time nor inclination to give attention to such small subjects as tooth-doctoring, or what some are pleased to dignify as dental surgery. No, young man, I am an M. D., and my advice to you is, if you really desire to become a *professional* man, go to college and get your degree of M. D.; you can then fool away all the balance of your days on teeth if you wish. I am sure no respectable physician will raise any objections. I rather think they would commend it. In fact, I, as an old member of the medical profession, would be glad to see some of our M. D.'s take up that specialty. It would help us physicians who pay no attention to such things, and we would then have some one with whom we could consult in obscure cases of disease without lowering our dignity as professional men; for, do you know, those infernal things called teeth play the very mischief with some of our patients, so that at times we are at our wits' end to know what to do next. Several times of late that modest fellow, with the absurd title of D. D. S. stuck at the end of his name, has helped me out of scrapes with my patients by telling me what was the trouble; but then he knows some things about medicine and is a good, honest fellow; so, you see, I don't mind consulting him, especially as he saves me a great deal of trouble by attending to my children's teeth without costing me much. Yes, sir, go to college *first* and get your M. D. degree, then you can fool around teeth to your heart's content, and if you should blunder sometimes it won't make much difference; we medical men will stand by you. That's my advice without a fee."—*Extract from an article by Geo. H. Chance, D.D.S. in Ind. Prac.*

FILLING DIFFICULT CAVITIES.—Dr. Merriam takes a small piece of gutta-percha, softens by heat and presses into the cavity, after examination, without drying. This gives the impression of the cavity; then remove and trim even with outline of cavity. Dip the gutta-percha in oil of cajeput, dry cavity, heat plug, carry to place and press home. This makes an excellent filling for cavities under the

gum where moisture cannot be excluded as the pressing in of gutta-percha, coated with this soft mass, carries with it the moisture of the cavity and we get adhesion under water.

Excellent cement for broken casts and models is made by mixing glycerine and litharge.

You will find that *soap* rubbed on the edges of your disks, or on the dam itself, will prevent catching and tearing the rubber dam.

Zinc oxide, carbonate of lime, and cocaine, make a soothing application to an aching pulp, which hardens into a perfect capping for exposed pulps.—*Genese.*

Bolting Teeth to the Jaw.—Dr. Stevens, of Fort Scott, Kan., bores a hole in the jaw, cuts a thread in it, screws in a post, puts on a crown and with a nut screwed on the post holds the crown fast. He records success so far. Now it is in order for some one to bolt or screw a bridge to the ridge. We are not laughing at anything these days.—*Southern Dental Journal.*

The Use of Soft Gold.—To ignore the advantages of soft foil and to be unskilled in its use is a misfortune to the patient, to the dentist and to the profession. The man is dwarfed who is not as ready to apply one system as the other.—*Dr. Perry.*

A New Tooth Wash.—The root of geranium suelda (Bolivia), dried and coarsely powdered, is steeped in twice its weight of 98 per cent. alcohol, thus affording a fine red tincture. Ten drops of the preparation in a glass of water will make a mouth wash surpassing anything known. It may also be applied with great benefit to decaying teeth with a little pledget of cotton.—*Ch. and Dr.*

APPLYING THE RUBBER DAM.

Dr. Matthews: I have succeeded sometimes in these cases by taking two wires, twisting the end and passing it over the tooth, and twisting the other end, and letting them stand out beyond. If you can get that wire down under the gum, you can work the rubber dam, and hold it every time.—*W. Jour. Report Kan. So,*

Local Anæsthetics.—The following are vaunted as reliable anæsthetics :—

℞. Cocaine hydrate, 4 per cent. sol........ 3 ounces.
Carbolic acid.................................. 5 drops
Chloral hydrate............................. 5 grains

Mix. Use hypo-dermically around the tooth.

℞. Chloral hydrate, Gum camphor, a.a. q.s. for 1 ounce. Rub well in a mortar to liquefaction and add carbolic acid 5 drops. This formula is due to Dr. J. C. Storey, who sends it to the *Southern Dental Journal*—

Apply on a bit of cotton around the tooth to be extracted—

Gum camphor........................... 2 drachms
Ether Sulph. Conc....................... 4 ounces

Mix. Apply round gum with cotton.

Another—Pure alcohol on a piece of cotton put around the tooth.

An Easy and Quick Method of Making a Counter-Die for Swaging Cusps for Gold Crowns.—Dr. C. H. Robinson says : Make of sheet brass, using hard solder, a cup three-fourths of an inch in diameter and half an inch deep, having a spur on one side by means of which it can be held in a pair of pliers ; fill it with Melotte's fusible metal. Select a natural or an artificial tooth for a model ; fill the soft rubber ring that comes with Melotte's Moldine with plaster, and invest the tooth so that the cusps project out of the plaster as far as it is desired to copy them ; when dry remove the rubber ring. Melt the metal in the cup, and just before it hardens in cooling, press the cusps of the tooth into it. The surplus metal will run over the sides of the cup, and a sharp and perfect counter-model will be secured, into which the gold plate can be swaged after the method of the S. S. W. die-plate, using the lead hubs or bullets. I also use for this purpose sheet lead 1-16 of an inch thick, cut in strips $2\frac{1}{2}$ inches long and $\frac{1}{4}$ to $\frac{1}{2}$ an inch wide, one end of which is folded upon itself two or three times letter S fashion, the other end being long enough to hold it by. As it becomes flattened in swaging, it can be folded back and forth over the gold plate.

By having one or more of these cups and a sufficient selection of teeth already invested in plaster, it is but a moment's work to select the size desired, and make the counter-die. Should it lose its finer lines in swaging, it can be remelted and an exact duplicate obtained in less than a minute.—*Dent. Review.*

COCAINE.

Dr. I. B. Munson said—

For this purpose he uses it in a very strong solution—almost a syrup of the crystals, applying it on a shred of cotton.

Painting the nostrils in the same way will almost invariably break up a cold in the head, a second application being seldom required. For extraction he considers ether or gas both safer and surer.

To Prevent Engine Cords Slipping.—Dr. George E. Rice says: Many have been annoyed by the constant slipping of the driving-belt on a dental engine when used with much power. I have discovered by experiment a very simple way to prevent slipping of the belt entirely. It is by the application of resin. It may be applied to the belt as a powder, or better by holding a piece of common resin in contact with the belt while the engine is running. The resin promotes friction between the belt and wheels in such a way as to make it possible to drive the engine with great force, allowing at the same time the use of a very loose belt, and with no perceptible slipping. It can be used on belts of any material, and it seems to me that this simple device will be found fully as efficient as the patent rubber rims that are sold for the purpose.—*Practical Dentist.*

Instrument Tempering.—Dr. Andres takes the crystals of cyanide of potassium and melts them in an iron crucible; heats the instruments in this liquid, and then dips them into a solution of silver, such as is used for silver plating. By doing this he gets an instrument that will stand better than if tempered by any other method.

Painless lancing of alveolar abscesses may be accomplished by the application of full strength carbolic acid and iodine, applied on a pledget of cotton. The crystallized acid, as it comes to us should be liquified by the addition of a few drops of glycerine, say ten to fifteen drops to the ounce.—*E. W. S., in Archives.*

Place on the mandrel, to sharpen instruments, three disks—one of thin metal, one of pasteboard, and one of emery paper, forming a flexible cushion, with even surfaces and no grooves.—*McLean.*

Dirty Hands.—For cleaning hands, however dirty, first rub well in warm oil, then sprinkle with powdered borax, and wash off in the usual way.—*Old File.*

Neutralize creosote on the lips or cheeks with vinegar.—*Atkinson.*

Oily dressing in a root canal, as the essential oils of cajeput, caraway, peppermint, etc., are pleasant to taste and smell, are both disinfectant and anodyne, are not dissipated by fluids, and do not impair the efficiency of cementum or pericementum.—*Harlan.*

SOME CREOSOTE.—Two hundred and forty thousand gallons of creosote were recently received from Germany at San Pedro harbor (the Los Angeles seaport), to be used in preparing piles (not hemorrhoids) for additional wharves. Human piles are prepared with carbolic acid, wooden piles with creosote.—*Southern California Practitioner.*

MANIPULATING AMALGAM.—Fillings in cavities difficult of access can be nicely started by saturating a pellet of cotton with sandarac varnish and touching to a piece of amalgam carry it into the cavity, wipe off the surface with alcohol, condense with pellet of cotton or bibulous paper and continue as desired.

MOUTH WASH.—The editor of the *Dental Record* prescribes the following:

R.	Boro-glyceride............................	aa. oz. j.
	Tr. Krameriæ............................	
	Eau de'Cologne........................	
	Spirits Vini Rect........................	ad. oz. viij.

Mix. A teaspoonful to be added to a little water.

EXTRACTING IMPRISONED WISDOM TEETH IN LOWER JAW.—My method is when the face of the tooth is looking towards and pressing against the posterior part second molar, so it is considered hazardous to use the elevating forceps; to split the gum back of the wisdom tooth, take the dental engine and with a sharp drill remove the bone, so the tooth can be raised upward and backward. You will find the bone easier cut than to cut tooth one-fourth away with discs in separating it from the molar, although it is sometimes best to separate with discs. By combining both methods we can extract such teeth without breaking *jaw bones.*—*A. Eubank.*

UNEQUAL ABSORPTION OF TISSUES.—A careful examination will show that there is usually more absorption upon the left than upon the right side of the mouth, where the teeth have been extracted from the

superior maxillary, in the place of and adjoining the canine teeth, requiring longer artificial teeth and thicker gums on that side to restore the contour.

Jaw Supporter and Stationary Mirror.—Take a mouth mirror that has been broken from the handle, fasten to it a piece of wire, sharpen end of wire and pierce into a cork, letting the patient bite the cork. This forms a desirable supporter for the jaws and the mirror can be turned to any desired angle to assist the operator.

Dr. Harlan's Tooth-Paste.—Below we give the formula for this preparation:

℞	Cretæ precip....................................	
	Pulv. orris rad., of each.........................	℥ ii
	Pulv. saponis Cast. alba..........................	℥ ss.
	Pulv. os. sepia....................................	ʒ ii.
	Pulv. myrrhæ......................................	ʒ i.
	Pulv. sacch. alba..................................	
	Pulv. boracis, of each............................	℥ i.
	Carmine...	grs. x.
	Ol. gaultheria	ʒ i.
	Glycerine...	
	Honey, of each.....................................	℥ i.
M.—Ft. paste.		

Popular Fallacies.—It is a mistake to labor when you are not in a fit condition to do so. To think the more a person eats the healthier and stronger he will become. To go to bed late at night and rise at daybreak, and imagine that every hour taken from sleep is an hour gained. To imagine that if a little work or exercise is good, violent or prolonged exercise is better. To conclude that the smallest room in the house is large enough to sleep in. To eat as if you had only a minute to finish the meal in, or to eat without an appetite, or to continue after it has been satisfied, merely to gratify the taste. To believe that children can do as much work as grown people, and that the more hours they study the more they learn. To imagine that whatever remedy causes one to feel better (as alcoholic stimulants) is good for the system, without any regard to the after effects. To take off proper clothing out of season because you have become heated. To sleep exposed to a direct draught in any season. To think any nostrum or patent medicine is a specific for all diseases flesh is heir to.—*American Analyist.*

Fragrant and Antiseptic Mouth-Wash.—We have published various formulas for preparing mouth-washes, the most pleasant and refreshing one being that which will be found on page 199 of the last volume of the *Dental Review.* Since this was published a suggestion was received from a competent authority to omit the sugar, as this is liable to interfere with the antiseptic character of the liquid. We think this suggestion a good one, and now propose the following amended formula, which has been practically tested. The essential oils used in its preparation should be of the very best and purest quality:

Safrol	360 min.
Oil of pinus pomilia	120 min.
Oil of curacoa	120 min.
Oil of vetivert	6 drops.
Oil of wintergreen	24 drops.
Oil of anise, Saxony	6 drops.
Oil of rose, geranium, Afr	6 drops.
Napthol	60 grains.
Deodorized alcohol	24 fld. oz.
Solution of saccharine	$\frac{1}{2}$ fld. oz.
Glycerine	8 fld. oz.
Purified talcum	2 troy oz.

SULPHO-CARBOLIC ACID.

Laplace has found that a mixture of twenty-five per cent. crude carbolic acid with an equal quantity of concentrated crude sulphuric acid gives a thick, syrupy, dark-brown mass which possesses great disinfectant power, inferior only to a five per cent. carbolic solution or a one one-thousandth acid solution of bichloride of mercury. No equally cheap, attainable, and effective disinfectant is known.—*International.*

TREATMENT OF PATIENTS UNDER CHLOROFORM.

In France, when a patient is under chloroform, on the slightest symptom appearing of failure of the heart, they turn him nearly upside down, that is, with his head downward and his heels in the air. This, they say, always restores him; and such is their faith in the efficacy of this method, that the operating tables in the Paris hospitals are made so that in an instant they can be elevated with one end in the air, so as to bring the patient into a position resembling that of standing on his head.

BRIDGEWORK

Can be anchored to teeth in the last stage of pyorrhœa alveolaris, and the patient will have the benefit of the bridge while the diseased teeth being firmly held in position can be easily brought into a healthy condition.

"Free Lance," the New Jersey correspondent of the *Review*, speaks in the highest terms of Dr. Parr's removable bridgework. The crowns or caps for anchorage are made as usual, gold bands being attached which form longitudinal slots or grooves on each cap, into which a heavy spring is inserted, making the work firm and rigid while readily removable by the patient. The value of this feature, from a hygienic point of view, will be readily recognized. Dr. Parr gives this freely to the profession, asking only a just recognition of his services.

Dr. J. G. Harper (*Archives*) dubs himself "a doubting Thomas" on the subject of bridgework, pronouncing it a physical impossibility for one member to do the work of half a dozen.

HOW TO INCREASE YOUR WAGES.

Every thinker knows that the man who would succeed must do more work than he gets paid for, in every profession and trade. We take it for granted that the man who will do only $20 worth of work a week because his salary is but $20 will never get more than $20 a week, for the simple reason that he has never shown his employer that he is worth more. We figure it that an employee who means to succeed has to do from 10 to 20 per cent. more work than he gets actual pay for. This he has to do until he reaches a certain point, and having reached that point, he will find that by as much as his income has increased, by so much has the demand for amount and intensity of his labor diminished. To put this theory into figures, we will say that a boy receiving $3 a week should do $4 worth of work; the boy receivinp $5 a week should do $7 worth of work; when he gets to be a man and receives $20 a week, he should do $30 worth of work; a man receiving $30 should do $40 worth of work, and so on until, say, the salary reaches $75, and then the laborer can give himself somewhat of a rest, that is to say, about $50 worth of work will satisfy his employer. Labor brings its market value, and is seldom overpaid, oftener underpaid. It is the experience—the "Know How"—that brings the money.—*Philadelphia Ledger*.

"If I gave you a pound of metal and ordered you to make the most out of it, what kind of metal would you select?" asked a well-known jeweler. "Gold, of course," was the prompt reply. "I'd prefer a pound of steel," said the jeweler, "and I'd have it made into hair springs for watches. A pound of such springs would sell for an even $140,000."

TO REMOVE FOREIGN BODIES FROM THE THROAT.

A British naval surgeon, Dr. Beveridge, states that for foreign bodies in the throat, such as pieces of meat, etc., a simple mode of relief is to blow forcibly into the ear. This excites powerful reflex action, during which the foreign body is expelled from the trachea. The plan is so easy of execution that, if there is anything in it, it ought to be generally known and applied.

Ink and rust stains are removed easily by a solution containing ten parts each of tartaric acid, alum, and distilled water. The solution has the trade name of "encrivoir."—*Pharm. Ztg.*

Magnesium is one-third lighter than aluminum, at the same time more dense, harder and tougher. An article made from German silver weighing 5.5 kg. weighs only 1 kg. if made of magnesium. Atmospheric influence is about the same on magnesium and aluminum, but while alkalies, such as ammonia or soda, attack aluminum considerably, magnesium is not affected by them at all. Magnesium is worked into objects having sharp edges, screws, etc., more readily and with better results. It takes a high polish, is readily hammered and rolled; can be swaged or pressed like tin into any shape. It is at present about one-fifth cheaper than aluminum.

REMOVING PULPS WITH WOODEN POINTS.

We have read so much about this operation that we concluded to try it:

Case 1. Palatal root, left upper first molar. The wooden point was saturated with 95 p. c. carbolic acid and the pulp with the same, allowing it to remain two or three minutes. The pulp was then popped out. The patient warned us not to repeat the operation.

Case 2. Right lower second bicuspid. Repeated the operation, but the patient threatened to leave and never return if it was repeated.

Case 3. Left upper second bicuspid, same result.

Case 4. Right upper second bicuspid. Bulbous portion of pulp already dead. The shock was very severe, but the patient supposed it was the thing to do, and did not complain much.

Case 5. Left lower second bicuspid. Applied arsenic for 24 hours, sealed the cavity with gutta-percha for 36 hours longer, then after applying the rubber dam and saturating the bulbous portion of the pulp for about ten minutes, drove the point into the root. The pulp was found about one inch from the tooth on the rubber dam, but the shock and pain were very manifest.

Case 6. Right upper second bicuspid. Pulp long exposed, and bulbous portion dead. Saturated with ten per cent. solution of alkaloid cocaine in eugenol for three or four minutes and removed the rootlet with little pain.

Case 7. Left upper first bicuspid. Bulbous portion dead from exposure, but rootlets alive. Removed same as Case 6. Same result.

Case 8. Left lower first molar. Bulbous portion dead from application of arsenic. Saturated the rootlets with carbolic acid and removed the pulp from posterior root. Very great pain. Could hardly persuade the patient to allow a trial in the mesial root, which had two canals. Finally drove the peg into one of the canals, which caused much anguish. Saturated the remaining rootlet with cocaine-ether, when it was removed without pain.

For the present we have concluded to apply arsenic in case of pulp exposure, for from 24 to 48 hours, remove the arsenic, wash the cavity with a solution of iron, apply tannin to the pulp, seal the cavity with gutta-percha for eight days, and then remove the pulp without the shock and pain attendant on the above mode of operating. All of the subjects were between the ages of 17 and 35 years. Three knew what was about to be done and five were unaware of the intentions of the operator. Our reflections from this series of experiences, are that some other medicament is probably better suited, from its local anæsthetic property, to be used in this method of removing the pulp, and that the shock is too great and too full of terrifying results for the average patient to endure, and still preserve his regard for the operator. Only one of the eight persons operated upon would be willing to undergo the same ordeal. Will some one of our readers tell *his* experience in this line?—*The Dental Review.*

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THE PRACTICE OF DENTISTRY FROM ITS FINANCIAL STANDPOINTS.

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The successful practice of dentistry, pecuniarily, is doubtless the aim of all who engage in it. There may be some who go into it with a scientific object, who, like Agassiz, do not wish to be troubled about "making money;" but these, we presume, are probably in the very smallest minority. The realities of life are such that it is not a question of what we *would* do, but what we *must* do.

We propose to lay before our readers some thoughts, statistics and truths, which we have gleaned for their consideration, both for and against.

Among the *ten or twelve thousand* dentists, which, it is estimated, practice this calling in the United States, we have discovered that only *three hundred and twenty are partnerships.* Most of these are between brothers and between father and son, making about three per cent. of the number so engaged. Among Physicians the percentage is about the same. With Lawyers the percentage is greater, while in commercial pursuits there are very few men who carry on a business without a partner or partners, making the percentage hard on to, if not quite, seventy-five per cent.

Whether this paucity of association be attributable to suspicion, jealousy, incompatibility of temper, or the teachings of experience as to which is best, we are not prepared to state

With merchants, one of the firm will attend to the finance, another to the selling, and still another to the buying of goods, so that the labor of business is proportionately divided.

We perceive in certain men in our calling, an aptitude in one for the management of a practice. He will have a plausible exterior, a winning expression, a taking manner, an attractive deportment. We know of cases of such men who were deficient in professional qualifications, yet, who on account of having these attributes carried on a

most successful business ; while others without these qualifications, yet well up in the material practice of their art were left far behind in the race. It may be that if partnerships between men possessing different qualifications were formed, such association would redound to their pecuniary advantage. The trouble is generally in such cases that the *worker* gets discontented. He complains *inwardly* that he, Smith, is doing all the work, while Brown does nothing but talk and say agreeable things to the ladies. He does not stop to consider that to say these agreeable things is *Brown's work, or qualifications*, without which there would be little or no work to be done, while he, Smith, though he does the work, owes to Borwn the work which is brought by Brown's manners. In another sense a dentist is not so tied down to his office with a partner as without one. Most of us get prematurely old by the constant strain incumbent on us, while a relief could be had, both physically and mentally, of a few weeks or days of recreation when we feel particularly jaded, and yet know that this needed rest is taken with no detriment to our business interest, such rest would be most beneficial.

We know of partnerships being formed among lawyers because of certain qualifications ; thus one of the firm would be particularly suited for *office work*, another for the collection of the *pertinent points of a case*, who might have no ability of language to make use of them, while still another, if the points were given him, *his eloquent tongue* would carry conviction to the minds of the jury. Thus by the combination of qualifications, several are made to succeed, while failure would attend the efforts of each singly.

We do not mean that such partnerships would be beneficial at all points, but especially *in large cities*. In villages, hamlets or small towns, business is too circumscribed for considerations such as we have advanced.

In large cities where a large practice is secured by a dentist, we have been informed that such men really make less, and are more harrassed than another dentist in a small town doing one-eighth the amount of practice, in consequence of the greatly increased expenses of living, rents, appointments, and style which the one is forced to keep up, which the other is not subjected to. Thus with a practice of ten thousand dollars a year (which is one which only the few exceed) in a large city, among a fashionable class, in a fashionable neighborhood where high rents, expensive style, appointments, etc., etc., etc., are the requirements, such a practitioner will rarely save more than one or two thousand a year. While the small practitioner, quite as well qualified, in the small town with a practice of twelve to fifteen

hundred a year, can readily save from eight hundred to a thousand dollars per annum, and this with no worry, no misgivings about the collection of bills, no strain of a large practice, and not tied down to business like the ten thousand dollar man.

We glean from the same source, that in large cities the revenue from the practice of dentistry will run from twenty-five thousand to two thousand dollars per annum. Perhaps two or three *at most*, out of a number of three hundred and fifty dentists in a large city may attain the former amount. Eight or ten may make ten thousand dollars per annum; twenty may attain a practice of five or six thousand per annum; a hundred or more will attain from twenty-five hundred to three thousand, and the remaining two hundred will struggle on with a revenue varying from twelve hundred to two thousand dollars a year.

We are informed by a leading physician that the revenue from the practice of medicine bears about the same proportions; some of the leaders *exceeding* the practices of leading dentists, but the bulk of the lesser lights having a revenue from its practice rather less than the bulk of dental practitioners.

From what we learn, the employment of assistants by dentists whose practice requires help, is not in favorable odor. The employment of lady assistants to do the many services required about an office is rather growing in favor, in preference to a regular graduate assistant to whom may be referred such cases which cause too much interruption to the dentists in full practice, yet even these are attended with certain drawbacks.

So much then for this side of the picture, let us examine the reverse.

The dentist and the physician hold more confidential relations with their patients, hence this may be the cause which prevents the formation of co-partnerships. Very many persons are extremely sensitive about their defects, and conceal these from their most intimate associates. We know of a lady who had a small gold plate with one or two teeth, which she wore for twenty-five or more years of her married life without her husband's knowledge, and very many are quite solicitous lest the "gold will show" for fear of their friends supposing they had defective teeth. We have likewise heard of the following case: Some years ago a lady called for an appointment for dental work. When it was fulfilled and the dentist was making an examination for such work as was needed, he remarked that the work that she had done to her teeth was unusually good, and her whole denture gave evidence of excellent dental care. "Yes," she answered,

"I have no fault to find with the dentist I had employed or the work he did for me, he has attended to my teeth a long time, and I regret being obliged to change; the only reason that I do so is that I cannot go to his office to fulfill an appointment without meeting his wife; she is always about, and if any one comes in whom she knows, she comes in the office to entertain them and stands by while they are in the chair. Now I like my dentist's wife very well, and am always pleased to meet her socially, indeed we exchange calls, and it is a pleasure for me to do so, but when I call upon her husband professionally, I consider her presence an intrusion. I am compelled to exhibit my defects to him, but I am not disposed to do this to any one to whom I am not compelled, and as I find that I cannot go to see him professionally without meeting his wife and have her also look into my mouth and at my teeth, I have left him."

We have heard of a dentist who lost many good, desirable patients from the employment of assistants, and some to such an extent that they finally left the profession.

A friend of mine told me: "I lost several patients whom I highly prized when I first introduced an assistant. Patients that *he* never worked for and whom I should not have placed in *his* hands. They told me plainly that they refused to sit in my chair knowing that there might be another patient and operator within hearing. Some left rather than even to let another make an appointment for me. These I know of; how many did likewise that I did not know the reason of their leaving me, I cannot tell." It is difficult to understand or to reconcile the many peculiarities of people. One patient will get quite angry if pain is suddenly inflicted, saying, "If you are to hurt me I want to be apprised of the fact, when I will brace myself to submit to the pain. Another will say, "if you are to hurt me I want to know nothing about it; it will frighten me more if you tell me beforehand that you are about to give me pain." Such are the temperaments of people. The objections to the presence or knowledge of "a third party," it is true, are in the large *minority*, but when we take into account the many peculiarities of patients and the impossibility "to please all," these straws show which way the wind blows, and may be taken as an objection to partnerships in the practice of dentistry and professions allied thereto.

The suggestion of a good business manager and a good operator making a good combination is open to the same objections as we have mentioned, and an additional one. If it worked well, and each was satisfied with the share of work each did, the fact would still remain that the work that paid and produced the income would be done by

one pair of hands, and it is questionable if that pair of hands would produce double the amount of work with the business man's help that they would without it?

If the operator was so little attractive in his manner and deportment that without that help he could do nothing, it would seriously detract from his usefulness at the chair, notwithstanding the fact that he might be a perfect operator. It is indeed questionable whether those qualifications needed in the business manager are not equally needed at the chair, and whether the real success is not as much due to managing the patient while operating, as in managing the practice or business?

In Europe, we are told that the business head or manager may have a half dozen or more operators under him, assigning to one or another work of this or that nature, as it presents, to one or the other of his assistants according to the known aptitude or specialty of each, thus doing all the real business while the operators under him do the work which he assigns. Yet though such arrangements may be pecuniarily successful there, we rather doubt its success here in America. Such a combination would not be considered "first-class," but would carry with it an odor of empiricism.

In the matter of partnerships, there is more union of interests between "father and son" and "brother and brother," than between strangers, however great may be the congeniality of temperament between these; and we would naturally look for less friction in the former associations, as well as less objection on the part of patients, than in the latter.

The subject of *taking rest* has not attracted as much attention as it should. Taking rest can certainly be easier done when the "bread and butter" question is not particularly pressing. But is time taken while resting really lost time? Does a needy operator, one, to make a strong case, who feels the loss of a single patient, risk more by a week's vacation than by a week's sickness? Would not the perspective patient be more apt to call again if told that "*the Doctor* was taking a week's vacation, and would be back in a week's time," than if told "*the Doctor* was sick but was getting better, and would undoubtedly be all right again in a week's time?" Would not the uncertainty implied in the latter message, the probability that if well enough to work he might not be strong enough to do the work well, carry with it a doubt on the part of the patient, rather inducing him to seek some one else? The world, or the people in it, are like children of larger growth, and what seems out of their reach will induce them to make greater exertions to attain it, and all experience shows

that persons are more disposed to help the man who is independent, or who needs help least, than the reverse. The mere fact that the Doctor was able to leave his business for a week or more would be to many a strong recommendation in his favor. Is not a jaded operator very liable, as the result of very weariness to do unsatisfactory work? He is more likely to do that unsatisfactory work for the new patient, whom he feels he cannot put off; he must get the thin edge of the wedge in if possible, by doing something; the old patient, or the one he feels secure of, he will ask to "call again," how much good will the work he thus does for the new patient redound to his credit, or do him in the long run?

We have presented these views on the "Practice of Dentistry from a financial standpoint," in both of its phases, as a subject which is not often written upon, that our readers may view it for their best interests and advantage and decide for themselves which is best.

A LABORATORY HINT.

By T. F. Chupein, D. D. S., Philadelphia.

When filling the upper ring of a flask—in repairing vulcanite work, it will generally be found that a large airhole is frequently formed in the plaster just poured in. This is caused by the plaster in the lower ring being dry and the air escaping from it forms the airhole. To avoid this, after the case is invested in the lower part of the flask, trimmed, bevelled and varnished ready for the investment of the upper ring, grease the whole surface and place it in a bowl of water while you mix the plaster for the upper ring. By this manipulation you will avoid what at times is very tantalizing in repair cases. The same proceedure may be observed for new cases as well as repair cases.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

(Continued.)

Q. What do you understand by the term "Dentition?"

A. It means the eruption, or what is popularly known as the cutting of the teeth.

Q. Is the term confined to one or more natural operations?

A. The process occupies two stages, viz.: first and second dentition. First dentition begins about the *fifth month* after birth, and ends about the *thirty-sixth month*. Second dentition begins about the *sixth year* and ends about the *eighteenth year*.

Q. Is there any order in reference to the eruption of the teeth?

A. No. Teeth of certain classes *generally* erupt at certain times, yet there is no regularity. The teeth of the *lower jaw* frequently are cut *before* those of the upper jaw. It has been observed that teeth that erupt *early* are often lost by decay *sooner* than when the dentition is delayed.

Q. Can you give me a description of the eruptive process?

A. It is thought that there is a gradual elongation of the teeth. The crown is formed first, then the roots. As the tooth lengthens it presses against its bony socket, which gradually absorbs or melts away to provide for its elongation or protrusion. In this way the teeth rise in their sockets and force their way through the gum.

Q. Do we not find that children are frequently ill during the stage of first dentition?

A. Yes.

Q. Is there any good reason why this should be the case?

A. No. As we find that in the lower animals this stage is proceeded with as a normal operation; yet at this early period of life the infant is very susceptible to nervous impressions, and in consequence of this, any constitutional disease is greatly aggravated by the process of cutting the teeth.

Q. Why should this be the case with human subjects more than with the brute creation?

A. We observe that although man is the highest type of the animal creation, yet at birth he is the most helpless. At the period of dentition, there is greater prominence of the nervous system, and consequently a greater sympathy in distant organs than in more mature life, and functional disorders are more readily induced at this time than later. All the organs are larger and less perfect in structure, and consequently less able to resist disease. These conditions account for the many infantile diseases which are met with among children and which are induced by dentition.

Q. What are some of the indications of dentition?

A. There is an increased flow of saliva. The infant keeps its fingers in the mouth and bites upon them in its effort at relief. The skin is hot. The gums are red. There is more or less fever and restlessness. Diarrhœa is frequent, which when not too copious is regarded beneficial. Eruptions appear on the face and head which are likewise considered beneficial in removing the irritation from the teeth. Ulcerations also appear on the lips, inside of the cheeks, the gums, and on the tongue, which are also beneficial.

Q. If these efforts of nature be not present, or do not give relief, what ensues?

A. There is an itching of the nose, a twitching of the muscles, disturbed sleep, general wakefulness, dilation of the pupils, loss of appetite, great thirst, irritability of temper ending in violent convulsions and sometimes death.

Q. What is the cause of this irritation during dentition?

A. When the teeth are ready to erupt their roots are not yet formed, the bone does not absorb or dissolve away in proportion to the growth of the tooth. This brings a disproportionate pressure on the advancing tooth, and as the pulp at this stage is very large, the sharp edges of the forming root press on this highly sensitive organ and causes the intense pain which is experienced.

Q. What means are used for the relief of these conditions?

A. The free use of the gum lancet. Gentle purgatives. Warm foot baths, to which mustard is added. Antispasmodics. Nervous sedatives. Cold applications to the head. Enemas of soap and water, etc., etc.

Q. At what age does second dentition begin?

A. Generally about the sixth year.

Q. Which teeth of the temporary set are the first shed?

A. Ordinarily, the two lower central incisors.

Q. What is the process of the irruption of the permanent teeth?

A. A process of absorption or dissolving takes place. The roots of the temporary teeth melt away before the advancing permanent tooth, until nothing remains but the crown, and this becomes so loose that it is readily removed from its slight adhesion to the gum, or is forced out of place by its permanent successor.

Q. What is the time of eruption of the permanent teeth?

A. The first molars about the 5th to 7th year.

The Central incisors	about	the	6th to 8th year.
The Lateral "	"	"	7th to 9th "
The first bicuspids	"	"	9th to 10th "
The second "	"	"	10th to 12th "
The Canines	"	"	11th to 13th "
The second molars	"	"	12th to 14th "
The Wisdom teeth	"	"	17th to 21st "

Q. Are any of the symptoms observed during second dentition as in first dentition?

A. No. Except in the eruption of the wisdom teeth. This frequently causes considerable pain, resulting in the formation of pus around the teeth, violent swelling which interferes with deglutition,

which may terminate in neuralgia, histeria, epilepsy, St. Vitus' dance, earache, deafness, disordered vision, spasms, etc.

Q. Are there any other periods of pain or disease connected with second dentition?

A. Sometimes there is a violent and protracted cough, with diarrhœa, wasting of flesh, loss of appetite, lowness of spirits, headache, and pains in the eyes about the tenth or thirteenth year, at the time of the eruption of the eye teeth or second molars, but this is not common.

Q. Is there any prescribed remedies for these diseases when they occur?

A. A relief from study, and no use of books except when used for pleasure or relaxation. Exercise in the open air, cheerful play and occupation, a residence in the country preferable to town, etc.

Q. Can you mention some of the peculiarities noticeable in the different teeth?

A. The *central incisors* of the *upper jaw* are ordinarily the widest of the oral teeth. Their roots are almost always cylindrical or conical. Ordinarily the centrals are about as wide as the cuspids, but they are at times wider.

Q. What about the *lateral incisors?*

A. They are narrower than the centrals, their roots are frequently depressed or flattened on the sides and the ends of the roots terminate into a sharpened point and with a crook or twist.

Q. Of the *cuspids?*

A. This tooth is ordinarily more prominent than any of the upper teeth. Their roots are the longest of any of the teeth, and terminate in a point. They are at times slightly flattened on the sides and not as round as the roots of the central incisors.

Q. The *First Bicuspid?*

A. This tooth is generally a little smaller than its mate, the second bicuspid, although the difference in size is not so pronounced as in the bicuspids of the lower jaw. The root of this tooth is generally flattened on the sides, and *bifurcates into two roots*, with sometimes a little crook or twist on the buccal root.

Q. The *Second Bicuspid?*

A. This tooth is generally slightly larger than the first bicuspid. Their roots seldom bifurcate into two points on the end, but ordinarily are fused into one. There is not observed that flattening or grooving on the sides of these roots, noticeable in the roots of the first bicuspids.

Q. The *First Molar?*

A. This tooth is almost always the largest of any of the teeth. It has three roots. Two towards the cheek and one towards the palate. The palatal root is almost always round or cylindrical. Of the buccal roots the posterior buccal root is smaller than the anterior buccal root, and the ends of these roots are frequently turned near their ends towards the back of the jaw.

Q. The *Second Molar?*

A. This tooth has about the same peculiarities as the first molar, only being slightly smaller in all respects.

Q. The *Third Molar*, or wisdom tooth?

A. The third molar is ordinarily (and frequently) much smaller than either of the other molars. It is shorter and rounder in shape, and the roots are fused into one, or if separated, the bifurcation is generally on the end of the root. When the roots of this tooth are separated, the ends are curved towards the back of the jaw like the roots of the other molars.

Q. What about the *central incisors* of the *lower jaw?*

A. The central incisors of the lower jaw are *narrower* than the lateral incisors. The roots are regular in shape and are flattened on the sides.

Q. The *lateral incisors?*

A. These teeth partake of the same peculiarities and form as the centrals, only being wider and a little larger. The lateral incisors of the lower jaw and those of the upper jaw are frequently the same width.

Q. The *lower cuspids?*

A. The lower cuspids are generally a little narrower than the upper cuspids. Their roots are long and slightly flattened laterally not as round as the upper cuspids.

Q. The *First Bicuspids?*

A. These teeth are markedly smaller than the second bicuspids. Their roots are very cylindrical.

Q. The *Second Bicuspids?*

A. The crown of this tooth differs considerably in shape from that of the first bicuspid, besides being larger. The root is almost the same shape.

Q. The *lower molars?*

A. The first and second molars have about the same general characteristics. The first molar being larger than the second. The roots of these teeth are invariably flattened, indicating a disposition on the part of nature to the formation of four roots. Two roots however are generally what these teeth are provided with, though there are a

few isolated cases where four roots have been found. The ends of the roots of these teeth curve sometimes, and the curve points to the back of the jaw.

Q. The *lower third molar?*

A. This tooth is rounder in form than either the first or second molars, and is smaller than either. The roots are frequently fused into one, but when separated and curved on their ends, the curve points to the back of the jaw.

BOOKS.

Dr. Pearson's dental appointment book has come to hand. It is of convenient size to carry about the person, and the arrangements for engagements are admirable. It is good for all time, and we recommend it to all dentists.

PRACTICAL PLACE.

A Sure Cure for Drunkenness.

A Russian physician named Portugaloff, declares that strychnine is an infallible cure for drunkenness administered in subcutaneous injection. He asserts that the experience of physicians has shown the cure to be rapid as it is certain. The effect of the strychnine solution is to change the craving for drink into positive aversion, and this change is effected in a day. After a treatment of eight or ten days a patient may be discharged. The strychnine is administered by dissolving *one grain* in *two hundred drops* of water and injecting *five drops* of the solution every twenty-four hours.—*Journal of Health.*

Dentistry in 1796.

American dentists of the present day may, with justice, lay claim to a high reputation for skill and ingenuity. The autograph letter of Washington, which appeared in the *Journal* of June 17, showed that considerable enterprise was shown also by our dental forefathers. We have before us an interesting document which gives quite accurately the degree of proficiency which had been reached in dentistry toward the close of the last century. It consists of an advertisement issued by one Josiah Flagg, surgeon-dentist, who "informs the public that he practices in all the branches with improvements, *i. e.*, transplants both live and dead teeth with great conveniency, and gives less pain than that heretofore practiced in Europe or America; sews up hare-lips, cures ulcers, extracts teeth and stumps or roots with ease, reinstates teeth and gums that are much depreciated by

nature, carelessness, acids, or corroding medicine, fastens those teeth that are loose, unless wasted at the roots, regulates teeth from their first cutting to prevent fevers and pain in children, assists nature in the extension of the jaws for the beautiful arrangement of the second set, and preserves them in their natural whiteness, entirely free from all scorbutic complaints. And when thus put in order, and his directions followed (which are simple), he engages that the further care of a *dentist* will be wholly unnecessary, eases pain in teeth without drawing, stops bleeding in the gums, jaws, or arteries, lines and plumbs teeth with virgin gold, foil, or leads. Fixes *gold roofs and palates*, and artifical teeth of any quality, without injury to, and independent of, the natural ones; greatly assisting the pronunciation and the swallow, when injured by natural or other defects. A room for the practice, with every accommodation at his house, where may be had dentifrices, tinctures, teeth and gum brushes, mastics, etc., warranted approved and adapted to the various ages and circumstances; also chew-sticks, particularly useful in cleansing the fore teeth, and preserving a natural and beautiful whiteness; which medicine and chewsticks are to be sold wholesale and retail, that they may be more extensively useful.

"Dr. Flagg has a method to furnish those ladies and gentlemen, or children, with artificial teeth, gold gums, roofs, or palates, that are at a distance and cannot attend him personally.

"Cash given for handsome and healthy live teeth, at No. 47 Newburg street, Boston (1796)."

The document is ornamented in one corner by very formidable and antiquated instruments, while in the other are to be seen tooth brushes quite of the modern pattern. It has been preserved by a descendent of one who, as may be seen on the back, purchased a brush and tincture from Josiah Flagg in the year 1800.—*Boston Medical Journal* 1875.

Tooth Soap.—X., Washington, D. C.—Your failure to prepare from castile soap a satisfactory tooth cleanser is owing probably to two causes—want of skill or necessary appliances in manipulation, and inexperience as to the proper kind of flavor. Pure neutral castile soap is the best "body" from which to make a tooth soap. To flavor it, the soap must be melted in a water bath until reduced to the proper consistency to allow of the incorporation of the flavoring substances. The melting is accomplished by shaving the soap into thin ribbons and adding a small proportion of water. When melted, the flavoring is stirred in and the soap poured into frames, and afterward

when firmly set, cut into suitable pieces by wires. These pieces are carefully dried, and, before too firm, pressed in moulds to give them a proper finish.

As there is necessarily some loss of flavor by volatilization when heat is used, the "cold process" is employed to advantage where the flavoring material is expensive. This consists in passing the soap shavings through rollers until a homogenous mass is obtained, incorporating the perfumes in the same way, beating into shape, dividing, and pressing as before. An industrious person may possibly successfully substitute a mortar for the rollers, but it is doubtful if as good results could be obtained from the former as from the latter.

Whether the cakes are obtained by the hot or cold process, it is scarcely possible to give them a finished appearance without pressure by appropriate dies.

As to flavors for tooth soap, those of a spicy character are rather preferable to those which may be distinguished as floral. Peppermint and spearmint are especially liked by many persons in tooth preparations, wintergreen is also a favorite, and cinnamon and cloves are useful in combination. The oils of these substances are of course used, and about two drams to a pound of soap will be sufficient for most tastes. We suggest the following mixture:

	PARTS.
Oil of peppermint	6
Oil of spearmint	3
Oil of cloves	1

This may be varied by the addition of cinnamon; the oil of red cedar wood is also a desirable flavor for dentifrices, forming with the three ingredients named in the above formula the base of the celebrated eau de botot. The oil of red cedar wood must not be confounded with the ordinary "oil of cedar" from the leaves, the latter being of a terebinthate odor. From the hints here given a few experiments should enable any one at all familiar with aromatics to secure some novel and pleasing combinations.

Professor Winchell's Paste.

According to the *Popular Science News*, Professor Alex. Winchell has a cement that will stick on any thing. The recipe is as follows: Take 2 ounces of clear gum arabic, $1\frac{1}{2}$ ounces of fine starch and $\frac{1}{2}$ ounce of white sugar. Pulverize the gum arabic, and dissolve it in as much water as the laundress would use for the quantity of starch indicated. Dissolve the starch and sugar in the gum solution. Then

cook the mixture in a vessel suspended in boiling water, until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by dropping in a lump of camphor, or a little oil of cloves or sassafras. This cement is very strong indeed, and will stick perfectly to glazed surfaces, and is good to repair broken rocks, minerals, or fossils.

Hygiene of the Eyes.

Dr. Lincoln, formulates in the *Annals of Hygiene*, the following rules to be observed in the care of the eyes for school work: (1.) A comfortable temperature, and especially let the feet be warm and dry. (2.) Good ventilation. (3.) Clothing at the neck loose, the same as regards the rest of the body. (4.) Posture erect, never read lying down or stooping. (5.)Little study before breakfast or directly after a hearty meal, none at all at twilight or late at night, (6.) Great caution about study after recovery from fevers. (7.) Light abundant but not dazzling. (8.) Sun not shining on desks or on objects in front of the scholar. (9.) Light coming from the left hand, or left and rear, under some circumstances from in front. (10.) The book held at right angles to the line of sight, or nearly so. (11.) Frequent rest by looking up. (12.) Distance of book from eye about fifteen inches.

How to Make Ground Glass.

A writer on this subject says: I desired to have several pieces of ground glass, to use for some purpose. I first bought five cents worth of emery and two plates of glass of the size required. Spoiled negatives will answer, if they are cleaned, which can be done with a strong solution of lye. I placed one of the glasses on a flat board, and sprinkled a small quantity of emery on it, which I wetted with water. Placing the other glass on that, I ground them together, renewing the emery and water whenever necessary. In about one hour I had two of the finest quality of ground glasses, fully as good as those I would have to pay 75 cents for, 8 by 10 size.

Regularity of Habit.

One of the most difficult of all minor habits to acquire, says an able writer, is that of regularity. It ranks with that of order. The natural inclination of most persons is to defer until the last possible moment, or to put it off to another time, where this can possibly be done. Yet habits of regularity contribute largely to the ease and comfort of life. A person can multiply his efficiency by it. We know

persons who have a multitude of duties, and who perform a vast deal of work daily, who set apart certain hours for given duties, and are there at the moment and attend rigidly to what is in hand. This done, and other engagements are met, each in order, and a vast deal accomplished, not by strained exertion, but by regularity. The mind can be so trained to this that at certain hours in the day it will turn to a particular line of duty, and at other hours to other and different labors. The very diversity is restful, when attended to in regular order. But let these run together, and the duties mixed, and what before was easy is now annoying and oppressive, and the exact difference between many is at this point. There are those who confuse and rush, and attempt to do several things at once and accomplish little, while another will quietly proceed from one duty to another, and easily accomplish a vast amount of work. The difference is not in the capacity of the two, but in the regular methods of the one, as compared with the irregular and confused habits of the other.

Freezing Mixtures.

Concerning methods of producing cold, there are three of which we shall here speak. The first is the well known one of imparting cold to water by dissolving in it certain substances, of which there are none which in our estimation can vie with nitrate of ammonia for general efficiency and undoubted convenience. In addition to this, it is also the most economical of all saline bodies, as it is not wasted during use, but may be employed over and over again. If a thermometer is placed in a tumbler of water, at say 50° Fah., and some crushed crystals of the nitrate of ammonia are then thrown into the water, the column of mercury will be found to descend with singular rapidity until it reaches 26° to 27° below the freezing point, or about 5° Fahr. There are several mixtures which can be made by which a much greater degree of cold can be obtained, but these when once used cannot be used again. But with the ammonium nitrate it merely suffices to pour the solution out into an evaporating dish after being done with, and having driven the water off by heat, or otherwise, place the crystals into a bottle, when they are ready for future use in a similar way.—*Scientific American.*

How to Perforate Glass.

To make a small hole in a plate of glass is a comparatively simple

matter. All that is required to do it is a very hard, sharp drill, some means for turning it and a lubricant such as turpentine, for causing the drill to cut rapidly. A drill made in the usual form from steel wire and hardened by heating it until it is dark red and then plunging it in mercury, will be very hard, but not tough. Before the drill is heated it should be driven into a block of lead so that its point will just be inclosed by the lead, and after the drill has been hardened in the mercury its point should be inserted in the indentation in the lead, and the temper of the shank of the drill should be drawn over a lamp or gas flame to a blue. The lead prevents the drill point from becoming heated sufficiently to draw the temper, by conducting the heat away as fast as it arrives at the point. When the shank of the drill becomes blue to within a short distance of the lead, the drill, together with the lead, should be plunged into cool water.

The drill prepared in this way should be wet with turpentine while in use to cause it to "take hold." It is advisable to drill from opposite sides of the glass whenever this is possible. The hole may be enlarged by means of a sharp round file wet with turpentine.

Creasote Treatment in Phthisis.—For many years, Dr. J. Solis-Cohen has been using creasote in phthisis, not as a specific, but for the purpose of preventing a retarding decomposition of undigested nutriment in stomach and bowels, on the same principle in which he has been using it in chronic diarrhœa for more than twenty-five years. He always prescribes the beechwood creasote, and is usually supplied with the product from Dupont's gunpowder mills. The dose given is half a minim three or four times a day after meals. This dose is rarely exceeded. The creasote is given in a gelatine capsule, with powdered extract of licorice to give it bulk, and, according as the indications may demand, powdered digitalis, quinine, iron, or iodoform, or any other drug required, may be added. The formula most frequently prescribed by Dr. Cohen reads as follows: Powdered iodoform, thirty grains; pure creasote (beechwood), fifteen minims; powdered extract of licorice, sufficient to make a mass, which is divided equally into thirty parts, which are dispensed in gelatine capsules, of which one is taken three times a day, after meals. Additional capsules containing one grain of iodoform are supplied when it is desired to increase the quantity of that drug without increasing the amount of creasote. It is ten or twelve years at least since Dr. Cohen has been using creasote in phthisis, alike in private, hospital and dispensary work, and with such benefit to nutrition that he rarely prescribes either cod-liver oil or syrup of hypophosphites.

Value of Eggs for Food.

Many of our best farmers have arrived at the conclusion that poultry raising is the most profitable thing they can engage in. Of the egg alone the London *Standard*, after stating of what it is composed, mentions the various purposes for which it is used.

Every element, the writer says, that is necessary to the support of man is contained within the limits of an egg shell, in the best proportions and in the most palatable form. Plain boiled, they are wholesome. The masters of French cookery, however, affirm that it is easy to dress them in more than 500 different ways, each method not only economical, but salutary in the highest degree. No honest appetite ever yet rejected an egg in some guise. It is nutriment in the most portable form and in the most concentrated shape. Whole nations of mankind rarely touch any other animal food. Kings eat them plain as readily as do the humble tradesmen. After the victory of Muhldorf, when the Kaiser Ludwig sat at a meal with his burggrafs and great captains, he determined on a piece of luxury—"one egg to every man, and two to the excellently valiant Schwepperman." Far more than fish—for it is watery diet—eggs are the scholar's fare They contain phosphorus, which is brain food, and sulphur, which performs a variety of functions in the economy. And they are the best of nutriment for children, for, in a compact form, they contain everything that is necessary for the growth of the youthful frame. Eggs are however, not only food—they are medicine also. The white is the most efficacious of remedies for burns, and the oil extractable from the yelk is regarded by the Russians as an almost miraculous salve for cuts, bruises and scratches.

A raw egg, if swallowed in time, will effectually detach a fish bone fastened in the throat, and the whites of two eggs will render the deadly corrosive sublimate as harmless as a dose of calomel. They strengthen the consumptive, invigorate the feeble, and render the most susceptible all but proof against jaundice in its more malignant phase. They can also be drunk in the shape of that "egg flip" which sustains the oratorical efforts of modern statesmen. The merits of eggs do not even end here. In France alone the wine clarifiers use more than 80,000,000 a year, and the Alsatians consume fully 38,000,000 in calico printing and for dressing the leather used in making the finest of French kid gloves. Finally, not to mention various other employments for eggs in the arts, they may, of course, almost without trouble on the farmer's part, be converted into fowls, which, in any shape, are profitable to the seller and welcome to the buyer. Even egg shells are valuable, for allopath and homeopath alike agree in

regarding them as the purest of carbonate of lime.—*Scientific American.*

An Evil Under the Sun.

The *Southern Lumberman* thinks that one of the most prolific sources of patent lawsuits is the use of mechanical or technical terms and expressions by alleged patent attorneys that may mean nothing or may be construed two or more ways. As a general rule, mechanics and inventors are not thoroughly versed in law English as it is written, and will sign specifications containing words and expressions the legal meaning of which they do not fully understand. Many of the so-called patent attorneys, who write the specifications which form a part of every application for letters-patent, are not at all familiar with the real meaning of the terms they use, and not one in a dozen is a practical mechanic. A few years' experience as an "examiner" in the Patent Office is considered equal to a graduating diploma from the greatest technical school on earth. A sap-headed son of a politician may get a situation as "examiner" and be discharged for incompetency, but, all the same, he will advertise himself as a "solicitor," and the most prominent line in his "ad." will be: "formerly examiner in the Patent Office." This fellow might, perhaps, have presided for a while as "examiner" of "hay rakes" in the division of agricultural implements, and yet he will charge and collect a fee from a poor inventor for writing the specifications for the most complicated woodworking machine or the latest electrical invention with fewer conscientious scruples than an army mule would feel in eating a peck of stolen oats. Some philanthropist could do the mechanical world a favor and win a claim to a starry crown in glory land by publishing a dictionary of mechanical terms in handy, cheap, pocket style, giving brief and accurate definitions of every word and term as construed by the courts.

Peroxide of Hydrogen in Necrosis of the Jaw.

Dr. A. Lohmann, of Cassel, communicates to the *Deutsche Medicinische Wochenschrift* several interesting cases from his dental practice. The first was that of a woman of thirty two years, suffering from necrosis of the left lower jaw. A sequestrum with both bicuspids was completely separated, and without trouble or pain removed; the posterior portion, which still contained a molar, was freely movable and full of pus. After several injections of peroxide of hydrogen the discharge of pus entirely disappeared, the gum regained a healthy

color, and in about a fortnight the patient was quite cured. The second case was that of a civil engineer, twenty-six years old, whose left upper jaw was diseased. After the removal of the sequestrum, which contained the last tooth and a bicuspid, peroxide of hydrogen was injected into the diseased alveolar processes at once and several times during the following days, and in a week the patient was completely cured. The author has even cured a case of alveolar pyorrhœa by this method.

Work as a Preventive.

"An ounce of prevention," we are told, is equal to sixteen ounces of "cure," and, if this is so, why do we invest so little in such ounces and then rush wildly after the hoped-for "pound of cure."

The sooner we bring ourselves to a realization of the fact that we are not cured of our ills simply by the use of drugs, and that, as our physicians are always repeating to us, their remedies can only "assist nature," the better will be our chances of having good health.

The best preventive is a sound, firm body, and this can only be secured by exercise. It is use that strengthens the muscles and hardens them, giving us freedom from that sense of fatigue that is the portion of all those whose muscles have become flabby from disuse.

When I hear women complain that they cannot walk, I feel like asking them if they have tried. If some coveted prize lay awaiting them at the distance of a quarter of a mile, could they not walk that distance to secure it? And, after walking as far as that each day for a week, could they not—provided the prize drew instead of drove them—walk half a mile? At the end of the first half-year I should not be afraid to guarantee them capable of walking a mile with perfect ease, and afterward, by the same easy stages, two or three miles, always provided, they discard heavy skirts, corsets and high heels.

And what has been proven a thousand times in the way of walking is no less true of all employments. If a woman has not been accustomed to doing housework, and suddenly assumes the duties, every muscle, and seemingly, every bone, will cry out in protest. Does it follow that she should sit down and declare that she is an invalid and not able to work? Not a bit of it. Just begin carefully, rest the tired back, relieve the lame arms, take it easy for a little, and gradually work into it—work into a strong, firm body that can rejoice in its own strength and freedom from fatigue.

It is one of the most kindly provisions of nature that the body can so quickly and readily, and withal so thoroughly, adapt itself to its

surroundings. So, instead of giving ourselves over to weak complainings, we have only to mark out the course that our judgment tells us is the wisest to pursue, and then steadily, patiently train ourselves to it.

Not only this, but the fact that exercise and fresh air are absolutely necessary to the maintenance of good health, makes this subject of becoming one's own "ounce of prevention" a very simple one, and the possibility of being, in a great measure, one's own healer, or, rather, one's own health-insurer, lies within the reach of all.

We may bring about the development of muscle by exercise in the open air and sunshine. But we must look to it that we secure a well-proportioned development by using all the muscles of the body, and not one set, to the neglect of others. We may secure this end by the use of dumb-bells, rowing, archery, walking, or what not, but the woman who secures the same result by working has gained just as much besides accomplishing the work itself.

One who indulges much in gymnastic exercise should be very well acquainted with the structure of the body, or she may do herself more harm than good. But if she who has work to do will go about it cheerfully, and a little carefully at the start, she may not only conquer the necessary task, but gain health and strength as well. It may safely be laid down as a general rule in all lives that steady work may be made the great healer.

Removing Paint.

The ordinary process of scraping old paint, or burning it off, is hardly expeditious enough for general purposes, and is also laborious. Soda and quicklime are far more thorough, and the paint is more quickly removed. The solution of half soda and half quicklime is thus made. The soda is dissolved in water, the lime is then added, and the solution can be applied with a brush to the old paint. A few minutes is sufficient to remove the coats of paint, which may be washed off with hot water. Many preparations are sold for the removal of paint, all of them having some basis of alkali. A paste of potash and strong lime is far more effectual in operation, and the oldest paint can be removed by it. Afterward a coating of vinegar or acid should be used to cleanse the surface before repainting. One authority on the subject recommends the gasoline lamp, a quart of oil being sufficient to last $3\frac{1}{2}$ hours. The method is considered superior to gas, as the flame is stronger and the cost less, besides which the lamp can be carried to any part, which cannot be done conveniently with a gas jet. But the use

of flame of either is dangerous and to be avoided when possible. Many a house has been burned to the ground from using jets of flame. For removing varnish, spirits of ammonia is used, but it is a slow process, and several applications are necessary. Scraping and sand papering can be employed; but it must be done carefully by experienced hands, or the surface of wood will be injured. The chemical process of removal has the advantage of leaving the surface in a better condition than burning off or scraping, and for large surfaces of paintwork is to be preferred.

To Restore the Freshness of Worn Clothing.

The mystery to many people how the scourers of old clothes can make them almost as good as new is explained in the *American Analyst* as follows: Take, for instance, a shiny old coat, vest, or pair of pants of broadcloth, cassimere, or diagonal. The scourer makes a strong warm soapsuds, and plunges the garment into it, souses it up and down, rubs the dirty places, if necessary puts it through a second suds, then rinses it through several waters, and hangs it to dry on the line. When nearly dry, he takes it in, rolls it up for an hour or two, and then presses it. An old còtton cloth is laid on the outside of the coat, and the iron passed over that until the wrinkles are out; but the iron is removed before the steam ceases to rise from the goods, else they would be shiny. Wrinkles that are obstinate are removed by laying a wet cloth over them, and passing the iron over that. If any shiny places are seen, they are treated as the wrinkles are; the iron is lifted, while the full cloud of steam rises, and brings the nap up with it. Cloth should always have a suds made specially for it, as if that which has been used for white cotton or woolen clothes, lint will be left in the water, and cling to the cloth. In this manner we have known the same coat and pantaloons to be renewed time and again, and have all the look and feel of new garments. Good broadcloth and its fellow cloths will bear many washings, and look better every time because of them.

Prof. Fresenius, of Wiesbaden, after a long series of chemical analyses, declares that an egg contains as much nourishment as a pound and an ounce of cherries, a pound and a quarter of grapes, a pound and a half of russet apples, two pounds of gooseberries, and four pounds of pears; and that 114 pounds of grapes, 127 pounds of russet apples, 192 pounds of pears, and 327 pounds of plums are equal in nourishment to 100 pounds of potatoes.

Silvering Iron.

A new Austrian patented process for silvering articles of iron is thus described: The article is first plunged in a pickle of hot dilute hydrochloric acid, whence it is removed to a solution of mercury nitrate and connected with the zinc pole of a Bunsen element, gas carbon or platinum serving as the other pole. It is rapidily covered with a layer of quicksilver, when it is removed, washed and transferred to a silver bath and silvered. By heating to 300° C. (572° F.) the mercury is driven off and the silver firmly fixed on the iron. To save silver the wire can be first covered with a layer of tin; 1 part of cream of tartar is dissolved in 8 parts of boiling water and one or more tin anodes are joined with the carbon pole of a Bunsen element. The zinc pole communicates with a well cleaned piece of copper, and the battery is made to act till enough tin has deposited on the copper, when this is taken out and the ironware put in its place. The wire thus covered with tin chemically pure and silvered is much cheaper than any other silvered metals.

Improved Indices.

Burr's patent combination index manufactured by the Burr Index Co., of Hartford, Conn., covers a long felt need in the way of improved indexes. We speak from experience, as we have had the Burr index in use in the *Scientific American* office foi over two years past. Our first order was for an index for 10,000 names. The work proved so useful we soon ordered another of still larger capacity.

This index is extensively used by the United States and Canadian governments, leading railroads, banks, insurance companies, and representative firms in all parts of the country. The system is complete, the plan simple for general use, readily understood, and so arranged that any name can be found at once.

The indices are made with great care, from the best of material, calculated for constant and hard use; made of any size, ranging in capacity from 500 to 1,000,000 or more names, and the largest number of names can be handled with the utmost rapidity and convenience.

Gold Beating.

The rough gold is put into a stone crucible, melted, and poured into a mould which gives it the right width for rolling. One hundred dollars' worth of gold is generally moulded at a time, the weight being about 5 ounces. It is then run through the rollers, the pressure

of which is so great that the little bar of gold that is 1 inch in width and about 3 inches in length after being run through several times, becomes a strip about 14 yards in length and about the thickness of a hair. The strip is then cut into 1 inch squares. These squares are put into what is called a cutch. This cutch is composed of 180 skins $3\frac{1}{2}$ inches square. The material that these skins are made of is an invention of French origin, and is kept secret. Formerly vellum was used. A gold square is placed between each skin, one directly over the other, until the cutch is filled. Two parchment bands are put over them in opposite directions to keep them from shifting. The cutch is then beaten for 15 or 20 minutes with a 16-pound hammer. The gold is then taken out of the skins, quartered by a skewer, and put into what is called the shoder. The number of skins in a shoder is 680. These skins come from what is called the bung gut of an ox, one animal furnishing but two skins. The shoder skins are 4 inches square. They are put between the skins in the same manner as in the cutch. They are then beaten for $1\frac{1}{2}$ hours with a 10-pound hammer, taken out and again quartered with a piece of reed. They are then put into the mould one over the other, as before, until the 900 skins which the mould contains are filled. This is beaten with a hammer weighing 7 pounds for three or four hours. The leaf is then ready to be trimmed and booked. Before the beating process the skins are heated and primed to prevent the leaf from sticking. Heated presses are used to take the moisture from the skins. Each skin is rubbed with a hare's foot with plaster of Paris on both sides before beating. Each one of the first squares of gold beaten out makes 25 leaves, or one book. The trimming of the leaves before they are put into books is done by a sled-shaped machine called a wagon. The trimming and booking is done mostly by girls. The trimmings that are left from the leaves are scraped together and melted over. A little salt added makes it thoroughly clean. The granite block that the beating is done on is about 3 feet in height, the top surface being ground down perfectly smooth, so as to prevent the blows of the hammer from cutting the under side of the mould.

FOR FETID SWEATING.—For the fetid secretion of the axilla or of the feet.

℞. Potassii permangantis......................1 drachm.
Aquæ..1 pint.
M. Sig.—Apply to the parts night and morning.

Quick and cheap kindling material for stoves may be made by soaking cobs in a hot solution of saltpetre mixed in the proportion of one pound of saltpetre to six gallons of water. These can be easily lighted with a match after they are dry, and will make a hot fire.

Moderate Exercises.

There is no better preventive of nervous exhaustion than regular, unhurried muscular exercise. If we could moderate our hurry, lessen our worry, and increase our open-air exercise, a large portion of nervous diseases would be abolished. For those who cannot get a sufficient holiday, the best substitute is an occasional day in bed. Many whose nerves are constantly strained in their daily vocation have discovered this for themselves. A Spanish merchant in Barcelona told his medical man that he always went to bed for two or three days whenever he could be spared from his business, and he laughed at those who spent their holidays on toilsome mountains. One of the hardest worked women in England, who has for many years conducted a large wholesale business, retains excellent nerves at an advanced age, owing, it is believed, to her habit of taking one day a week in bed. If we cannot avoid frequent agitation, we ought, if possible, to give the nervous system time to recover itself between the shocks. Even an hour's seclusion after a good lunch will deprive a hurried, anxious day of much of its injury. The nerves can often be overcome by stratagem when they refuse to be controlled by strength of will.—*James Muir Howie, in the Nineteenth Century.*

Treatment of Ingrowing Nail.

A very simple treatment of ingrowing nail is proposed by Patin in the *Gazette des Hopitaux.* After cleansing and disinfecting the affected nail, the parts between it and the granulations are painted with a solution of 1 part of gutta-percha to 8 of chloroform; this painting is done at first a number of times a day, but later less frequently. The foot is protected somewhat, and by degrees the nail lifts itself from the tissue in which it was imbedded; it may then be removed without pain by the scissors. The solution acts as an anæsthetic by virtue of the chloroform, and mechanically through the gutta-percha, which insinuates itself between the nail and the granulations, and so frees the former from ingrowing tissue.

A Simple Method of Making a Piece of Bridge-Work.—Dr. T. A. Long says: Prepare the teeth or roots that are intended for your anchorages in the same way as usual; make gold caps or crowns to fit over them. Make the gold crowns either with gold or porcelain cusps. Place the gold caps on the anchorage teeth, and take an impression in plaster or modelling compound. If the gold caps do not come away with the impression, take them out of the mouth and place them in their right position in the impression and cast the model in plaster. When taking the impression take two of them; one with the gold caps on the anchorage teeth, and one without. Make a model from the last named impression for use later on.

Now take a strip of wax about 1-16 of an inch thick and the width of the ridge, or as wide as the case should be when finished, place it on the model reaching from one gold cap to the other. Place on this wax a piece of gold plate sufficiently heavy to give the necessary strength, and long enough to reach from one gold cap to the other, and folded at an angle thus, L, its entire length, curved longitudinally to conform to the bend of the ridge. Place this gold angle bar so that the outer edge of one angle will point toward the labial surface or cheek, and the other edge of the angle toward the top of the piece. Now invert this and solder each end of the gold angle bar to its respective gold crown or cap. This should now be tried in the mouth, and any correction that may be necessary to fit it can be made.

It will be found that the gold angle bar will be raised a slight distance from the ridge. Take the new model and place the skeleton on it, use gum or plain teeth, the same kind as are used for rubber work, wax up the piece same as for a rubber plate, covering up the gold angle bar entirely and allowing the wax model to rest upon the ridge. A slight groove running around near the edge of the piece on the plaster model will leave a corresponding ridge on the finished piece, which will prevent seeds or particles from getting under the plate. If there should be any shrinkage of the gum, the piece can be kept clean underneath, as then access can be had to that part. If no shrinkage takes place, experience has taught us that no bad effects follow placing the piece firmly on the gum.

The advantages of this bridge, are: Great strength, simplicity of construction, freedom from retaining secretions under gold plates or gold backings on teeth, as there are no points to retain saliva. It is not liable to be broken, as the teeth can be heavy and strong, and be supported by the vulcanite. The appearance in the mouth is more natural, as it avoids such a great display of gold.

The above was described to me by Dr. Wm. N. Morrison, of St. Louis, and coming from such an eminent practitioner, I am under the impression that it must be practical.—*Dent. Review.*

The Roman Catacombs.

As reported in the *Architect*, London, a lecture was delivered lately in Liverpool, by Professor Stokes, of Dublin, on "The Church and Catacombs of Rome." The professor said that his own idea before he studied the subject was that the city of Rome was built over them, that the catacombs had furnished the building material for the city thus erected, and that the early Christians having discovered those excavations under their houses, made secret entrances into them, so that when any danger threatened them, or when they desired to worship in secret, they just retired into those vast and gloomy recesses.

The catacombs of Rome, however, were of quite a different character. They were not under the city at all—they were all outside, they were excavated in the hills that surrounded the city. Nor were the catacombs the usual places of worship of the early Christians, because they possessed church buildings at a much earlier period than people imagined. There were writings showing that long before the reign of Constantine, the Christians erected most magnificent churches. Eusebius told them that "not content with the ancient churches, the Christians erected spacious churches."

The edict of Diocletian ordered the destruction of the churches and the confiscation of lands attached to them, while there were other evidences of the existence of churches at the end of the third century.

The whole extent of the catacombs they knew not as yet, as most probably there were numerous catacombs still to be discovered. Competent authorities estimated the whole length of the catacombs as reaching 350 miles. This might seem an enormous length, but they must remember that the catacombs were excavated on different levels, so that four or even five galleries ran one above the other—in fact, the whole soil for thirty or forty miles around Rome was honeycombed with them. These galleries were narrow, and ranged from 2 to 4 feet in width, and were from 8 to 10 feet in height.

The lecturer next described the pagan burial clubs and said the early church was built in the form of a catacomb, because it took the name, shape, and constitution of a pagan burial club. It was under the cover of these pagan burial clubs that Christianity seemed to have taken refuge and shelter for the first 200 years of its existence, and through the toleration afforded to those burial clubs the Christian

church was enabled to execute the vast operations involved in the formation of the catacombs. They had the testimony of Tertullian that toward the end of the second century Septimus Severus owed a great deal to Christian neutrality in the great civil war which raged at that time. The Christians had grown so numerous that it was almost as important for them to gain their neutrality as it was to gain their active co-operation.

In his subsequent remarks as to the excavation of the catacombs, the lecturer explained the means that the church possessed to carry out such a vast work, and stated that the excavations were the result of the labors of the fossores or diggers, who were reckoned among the inferior clergy.

Professor Gale the Discoverer of Electric Telegraphy?

In a cabinet in the Western Union telegraph office in this city may be seen the crude apparatus, his own handiwork, with which Samuel Finley Breese Morse made the first practical demonstration of his conception of recording signals by the action of electro-magnetism at a distance, the distance being not greater than across a large room. When the length of the wire was increased. the action was so enfeebled as to render the apparatus inoperative. Leonard A. Gale afterward suggested to Morse to wind his electro-magnet with a fine wire (of high resistance) and thus adapt it to the purpose for which it was intended, viz., the transmission of signals to great distances.

But suppose Morse did construct a telegraph consisting of a stylus moved by electro-magnetism, which was exhibited in actual operation for days or weeks or months, was it a successful invention? Would the Western Union Telegraph Company purchase or use such a machine now? Did it not lack an essential ingredient which was necessary to its commercial usefulness? Did he go any further in principle, if he did in degree, than did Henry in 1831? It would seem that he was following a wrong principle, the principle of small resistances in his electro-magnet and a strong current of electricity; and that the great discovery in the art of telegraphy was that of employing high resistance in the electro-magnet, with a small core, and a corresponding diminution in the strength of the current required. This was accomplished by Gale, in his filamental, thread-like magnet wire, rendered practicable by the placing of the battery elements in series. With such a battery, the slender filamentary magnet wire, attenuated to the last degree of fineness, may be made to do its work through a circuit of hundreds of miles with a small expenditure of electric force. This

was really the grand discovery in the art of electric telegraphy, without which it could not have become a practical art.

Of course, the form into which the wire is coiled may be varied at pleasure ; it may be wound upon a cylinder or a horseshoe, or it may surround a galvanometer needle. All these forms are old. The principal and great thing is the attenuated conductor, and its use in connection with a series of many cells. There may be a preference in the metal from which the attenuated conductor is made. Practice will evolve all these collateral advantages.

We think we are not mistaken in saying that, but for this discovery, electric telegraphy never would have become a fact. We may suppose it to have been the discovery of Professor Gale. It may not have been so; it may have been the discovery of Professor Henry. But whoever discovered it, it is undoubtedly *the* great discovery in the art of communicating intelligence to a distance by electricity. We have given a more detailed account of it, in order to illustrate what we mean when we raise the question whether the claimed invention of Morse was ever successful. He may have made a telegraph that would record arbitrary signs, capable of being interpreted ; but was it a success, or was it a failure? Did it ever go into use? What was the object of all the experiments made by him and others? Was it not to make an electric telegraph that could be successfully used by the public, and have a commercial value? Did he succeed in making such a telegraph or in finding out, until Gale told him, the principle upon which it could be made? We do not so read the evidence. In view of the most recent decisions, Gale, and not Morse, is the man to whom we are indebted for the art of transmitting telegraphic signals to a sufficient distance to be of any practical utility.—*The Electrical*

Casting Plate Glass.

The casting tables, the most important pieces of apparatus in a plate glass works, are 19 feet long, 14 feet wide, and 7 inches thick. Each is provided with an iron roller 30 inches in diameter and 15 feet long. Strips of iron on each side of the table afford a bearing for the rollers, and determine the thickness of the plate of glass to be cast. The rough plate is commonly nine-sixteenths of an inch in thickness; after polishing, it is reduced to six or seven-sixteenths. The casting tables are mounted on wheels, and run on a track that reaches every furnace and annealing oven in the building.

The table having been wheeled as near as possible to the melting furnace, the pot of molten glass is lifted by means of a crane, and its

contents quickly poured on the table. The heavy iron roller is then passed from end to end, spreading the glass into a layer of uniform thickness. The whole operation of casting scarcely occupies more time than it takes to describe it. Each movement is made with almost nervous rapidity. Few industries offer such a fine scenic display as the pouring of molten glass. One feels like crying "Encore" it is so very brilliant.

In contact with the cold metal of the table the glass cools rapidly. As soon as possible the door of the annealing oven is opened and the plate of glass introduced. The floor of the oven is on the same level as the casting table, so that the transfer can be conveniently and quickly made. When, after several days, the glass is taken out of the oven, its surface is found to be decidedly rough and uneven. A small quantity is used in this condition for skylights and other purposes where strength is required without transparency. It is known in the market as rough plate. The greater part of the glass, however, is ground, smoothed and polished before it leaves the establishment.—*British Mercantile Gazette.*

Colloidal Cellulose.

Guignet states in the *Comptes Rendus* that cellulose is converted by sulphuric acid of 50° B. into a gelatinous transparent mass, which, when washed and dried, forms a milky solution with water. This solution contains colloidal cellulose, is unchanged on boiling, and is slightly dextro-rotatory. The cellulose can be precipitated from the solution by the addition of salt, sulphuric acid, or a large quantity of alcohol; it does not reduce copper solution, and gives no coloration with iodine. If the water be evaporated, and the residue touched with a drop of sulphuric acid, the colloidal cellulose is transformed into the insoluble variety. Artificial parchment, or parchment paper, seems to consist of ordinary cellulose in which the pores are filled with this colloidal variety, and can be prepared from filter paper by coating both sides with a solution of the colloidal cellulose, and then subjecting the coated paper to pressure between zinc plates.

Headache.

The etiology of many forms of headache is still quite obscure. Dr. A. Haig maintains that one variety of periodic headache is directly due to the retention of uric acid in the system. The usual sequence of events, according to him, is as follows:

There is a time (say seven or ten days) of good general health, active nutrition, and bodily activity, with plus formation of uric acid and urea, and concomitant rise in acidity. As acidity rises, uric acid comes to be retained, and at the end of four or five days several grains may be regarded as stored up in the liver and spleen. Then comes dyspepsia, gastro-intestinal catarrh, and hepatic congestion (and Dr. Haig is not by any means certain that this hepatic congestion and gastro-intestinal trouble may not be the direct result of the accumulation of uric acid in the liver and spleen). These quickly result in general diminution of absorption and nutritive changes, with lessened formation of uric acid and urea and a fall in acidity; and lastly, as the result of this falling acidity, there comes a rush of the stored uric acid into the blood, and the headache begins.

Such a sequence may be seen to some extent in the figure that accompanies his paper on headache (*Transactions*, 1887,) for there the urea drops from five hundred and sixty-one grains to three hundred and sixty-three grains in the four days that immediately precede the headache. Although acidity was not estimated in this instance, there can be no doubt that it followed and shared in the fall of the urea to a large extent. Such a sequence explains the periodicity of this kind of headache, and the way in which it comes to occur every week or ten days for many years, varying only in degree with the corresponding variations in nutrition. It is also evident that any causes which affect digestion will influence the attack in one of the above ways; while all causes of debility, by weakening the nerve centre on which the uric acid acts, will render it more sensitive (the reverse of the action of bromides) and the attacks more frequent. A knowledge of these facts give him almost complete power either to cause or cure this headache in himself and other sufferers.

The good effects of salicylic acid, and the salicylates generally, in this variety of headache, are due to the circumstance that they facilitate the excretion of uric acid, and thus prevent the retention of excessive amounts within the body.—*Medical Record.*

ETCHING LIQUID FOR STEEL is made by mixing 1 ounce of sulphate of copper, $\frac{1}{4}$ ounce of alum, and $\frac{1}{2}$ teaspoonful of salt reduced to powder, with one gill of vinegar and 20 drops of nitric acid. This liquid may be used either for eating deeply into the metal or for imparting a beautiful frosted appearance to the surface, according to the time it is allowed to act.—*Exchange.*

GROWTH OF THE CHILD'S MIND.

In the last volume of the "Education Series," on "The Development of the Intellect," Mr. H. W. Brown has presented a conspectus of the observations of Professor Preyer on the mind of the child. This conspectus shows chronologically the gradual development of the senses, intellect, and will of the growing child, and presents in a condensed form the result of a great number of careful observations. Many of these results are already well known, but the presentation of them in a systematic and complete way has not heretofore been done.

It is recorded that sensibility to light, touch, temperature, smell and taste are present on the first day of infant life Hearing, therefore, is the only special sense which is not active at this time. The child hears by the third or fourth day. Taste and smell are senses at first most active, but they are not differentiated. General organic sensations of well-being or discomfort are felt from the first; but pain and pleasure, as mental states, are not noted till at or near the second month.

The first sign of speech in the shape of utterance of consonant sounds is heard in the latter part of the second month; these consonants being generally "m," "r," "g," or "t." All the movements of the eyes become co-ordinate by the fourth month; and by this time the child begins to have the "feeling of self," *i. e.*, he looks at his own hands, and looks at himself in the mirror. The study of the child's mind during the first year shows conclusively that ideas develop and reasoning processes occur before there is any knowledge of words or of language; though it may be assumed that the child thinks in symbols, visual or auditory, which are clumsy equivalents for words. By the end of the year the child begins to express itself by sounds, *i. e.*, speech begins. The development of this speech capacity is, according to Preyer, in accordance with the development of the intellectual powers. By the end of the second year the child's power of speech is practically acquired.

Professor Preyer's most striking and important conclusion, in his own opinion, is that the normal infant can form concepts and perform logical operations without the aid of words, or gestures, or symbols of any kind. He also shows what was known before, that the infant understands spoken language before he can produce the sounds he hears; and finally that the child, before he begins to speak, forms all the sounds that occur in his future speech. Professor Preyer thinks that by his observations he "has bridged over the only great gulf between the child and the brute animal."

The learned professor does not believe in stimulating the infant imagination by fairy stoiies or religious myths; but he believes in ' Æsop's Fables,'' and has his son repeat one to him every morning. Such are some of the advantages of being the son of a physiologist.—*Medical Record.*

Ten Good Things to Know.

1. That salt will curdle new milk, hence in preparing milk porridge, gravies, etc., the salt should not be added until the dish is prepared.

2, That clear boiling water will remove tea stains and many fruit stains. Pour the water through the stain and thus prevent its spread-ing over the fabric.

3. That ripe tomatoes will remove ink and other stains from white cloth, also from the hands.

4. That a tablespoonful of turpentine boiled with white clothes will aid in the whitening process.

5. That boiled starch is much improved by the addition of a little sperm, salt or gum arabic dissolved.

6. That beeswax and salt will make rusty flat irons as clean and smooth as glass. Tie a lump of wax in a rag and keep it for that purpose. When the irons are hot, rub them first with the wax rag, then scour with a paper or cloth sprinkled with salt.

7. That blue ointment and kerosene mixed in equal proportions and applied to the bedsteads is an unfailing bedbug remedy, as a coat of whitewash is for the walls of a log house.

8. That kerosene will soften boots or shoes that have been hard-ened by water, and render them as pliable as new.

9. That kerosene will make tin tea kettles as bright as new. Saturate a woolen rag and rub with it. It will also remove stains from varnished furniture.

10. That cool rain water and soda will remove machine grease from washable fabrics —*The Sanitarian.*

Notice.

The editor takes this means of informing the readers of the D. O. and L., that he cannot undertake to answer all the little questions which he has heretofore (through a spirit of courtesy) done; questions which any school boy should be able to answer. He is perfectly willing to afford all the aid in his power to a struggling brother, but more than this he must decline to do.

The Fiftieth Commencement of the Baltimore College of Dental Surgery, will be held on Thursday, March 20, 1890. All graduates and friends of the College are invited to be present.

THE

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OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

We propose in these papers to go over the ground of operations on the teeth, from those of the simplest character to those the most complex. We are writing for the dental student, not for the practitioner, and we trust to be able to smooth the path for these.

A case presents. A mother brings her daughter for dental examination. The young lady has attained her sixteenth year. All of her temporary teeth have been replaced by their permanent successors. The case is placed in your hands:

Before doing anything wash your hands, and let your patient see you do it. You are supposed to have your finger-nails clean; if not, clean them. Your face, clothes and shoes should be cleaned as well, and your hair combed—not at the time of your patient's entrance, but always.

As to your office costume, a white linen drill or duck sacque is what is mostly worn. These are better and less expensive than a short working sacque of light cloth material faced with silk, because these facings are soon soiled, and look shabby from contact with the hair or heads of the patients, while the linen is pleasant to the cheek of the patient, and may be washed whenever soiled.

A pleasant smile, an easy, but not familiar manner, and an agreeable conversation of an edifying nature may be engaged in as introductory, as it will tend to disarm the fear incident to the first experience in the dentist's chair, and to proclaim your character as an intelligent man.

A few drops of violet water, or toilet vinegar put into the palm and rubbed over the hands and fingers induces a pleasant feeling of cleanliness, and goes a great way in producing a favorable impression. No display of tools. A *clean* glass of *clean* water, into which the mouth mirror is dipped before placing it in your patient's mouth,

which is wiped dry on a *clean* mouth napkin. A cursory examination may now be made. You find there is an accumulation of tartar behind the lower incisors and cuspids, a green strain on the labial surfaces of the upper incisors, slightly extending to the cuspids and perhaps the bicuspids, and an incrustation of tartar on the buccal faces of the upper molars, and a tumefied condition of the gums in front of the lower incisors. You recommend the teeth to be cleaned as an initiatory step.

Your first effort will be the removal of the tartar from the lower teeth. For this purpose the instruments shown in Fig. 1 will be needed. With the mouth mirror in the left hand, it is placed in the patient's mouth from the left side, the operator standing on the right and a little back of the patient. The light is reflected by the mirror on the backs of the teeth, and the instrument No. 1 is held in the right hand and passed under the adhering tartar and removed with a slight pull; some of the fingers of the right hand resting on the lower teeth to prevent slipping.

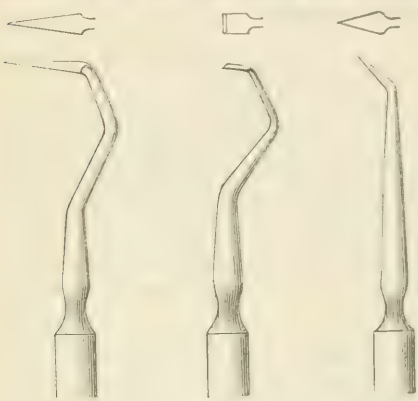

Fig. 1.

Should some of the tartar encroach on the bulbous part of the crown the instrument No. 2 may be used with the same pulling or scraping motion, but if it resists, the pulling instrument No. 3, used with a pushing motion, will generally dislodge it. In the use of these instruments some of the fingers should *always* be placed on some adjoining tooth or teeth to avoid wounding by slipping. In the use of the instrument No. 1, the blade should be passed well through between the teeth, so as to remove the tartar collecting between the teeth, but if this should not be effective, such an instrument as is shown at Fig. 2 may be effectively used between the teeth, by standing in front of the patient. This instrument is shaped like a small gum lancet, and is known as No. 15 of Dr. Corydon Palmer's nerve instruments. The tartar collecting on the labial surfaces of the lower incisors may be effectively removed with the instrument No. 2 (Fig. 1.) With the instrument No. 1 (Fig. 1) the tartar may be readily removed from the buccal faces of the upper molars. It is well to take these after the


Fig 2

lower front teeth, because there will be always blood flowing around the lower teeth, and by letting them rest awhile until the bleeding subsides, you can return to them again, and remove such small particles as may have been hidden by the blood or had escaped notice.

For removing the green stain on the labial surfaces of the upper front teeth, put a few drops of the tincture of iodine in one of those square solid glass individual salt-cellars. With a piece of orange wood stick cut to a wedge shape on one end, dip this into the tincture and rub the stain on the teeth with the stick. From time to time pick up on the moistened stick a little fine-powdered pumice stone, and keep up the rubbing until the stain is removed.

Fig. 3.

When the teeth are freed of all hard tartar and stain in the manner described, a small polishing brush placed in a proper mandrel as shown in Fig. 3 is used in the dental engine. Some moistened powdered pumice stone is daubed over the faces of the teeth, with a small spatula such as is used for mixing phosphate of zinc filling material, beginning at the molars on the right side of the upper jaw and going regularly around to the upper central incisors, standing and working the engine on the right side of the patient. Then the same procedure is observed to clean the lingual surfaces of the lower molars, bicuspids and incisors on the left side, and the palatal surfaces of the upper back and front teeth. After this, move the engine on the left side of the patient and cleanse the molars, bicuspids and incisors on the left side upper jaw, and the lingual and palatal surfaces of the upper and lower teeth on the right side. In this way all the teeth will be thoroughly cleansed on all their surfaces. In the use of this brush for cleansing the teeth a certain amount of pressure is necessary so as to make the bristles of the brush flare over the surface of the tooth as shown in Fig. 4. Dr. I. B. Wood has devised some small rubber cups of different sizes used on a Huey mandrel in the dental engine, as shown in Fig. 5. They are very effective in cleansing the teeth. It is needless to say that *the brushes should be thrown away after use*, as it would be a filthy trick to use one brush to clean several persons teeth.

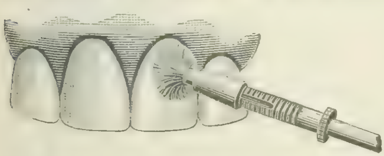

Fig. 4.

As the blood flows pretty freely in this operation of cleansing the tartar, a number of napkins should be at hand to remove the blood

and tartar which adheres to the instruments. For many years we have used linen for napkins. We purchase two or three yards of fine linen, and cut this up into pieces about 7 inches long by 5 inches wide. This will make from four to five dozen. We do not have them hemmed, as the hem makes them bulky. By the time you have accomplished this much for your patient, an hour or more will have passed, and therefore your patient should be discharged, as it is preferable not to keep a patient in the chair for more than *one hour at a time.*

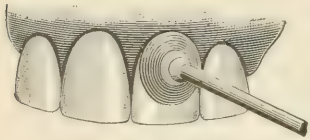

Fig. 5.

You therefore set an hour for some other day for the continuance of such work as she may need, taking her name, address and reference, if she be unknown to you.

On resuming work for her you continue the work left off.

There is a diseased condition of the gums, frequently incident to the excessive deposit of tartar in which the gums are tumefied or hypertrophied, and lie in loose folds on the teeth with no adhesion. The gums bleed at the slightest touch. Such a condition is shown in Fig. 6. Before attempting to remove the tartar in such a case we freely deplete the gums. This is done with a small pair of curved-blade scissors, as shown in Fig. 7. Opening the blades about as much as is shown in the cut, the flabby, overlapping pieces of gum between each tooth is snipped off, as is shown in Fig. 8. This is done so quickly that it gives little discomfort to the patient. The gums may be washed with water, in which a tablespoonful of phenol-sodique is put in the proportion of a tumblerfull of water to the quantity mentioned of phenol-sodique.

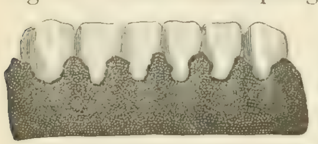

Fig. 6.

After this a swab is made by wrapping a lint of cotton floss around the end of an orange wood stick, and some deliquesced iodide of zinc used on the depleted gum by means of the swab. We use this drug to its full strength. It absorbs moisture from the atmosphere very readily, and it is only necessary to let the powder in the bottle be exposed to the air for a day or two for it to become liquid. A few drops of it are poured into an individual salt-cellar, and used on the gums from this.

It may be well now to instruct your patient how to keep her teeth cleaned. *A hard, stiff brush should not be used*, but rather a soft or medium stiff one. The brush should not be carried across the teeth

only, but so used as to force the bristles between each tooth, brushing the upper teeth *down*, and the lower teeth *up*. Instruction should be given how to use the waxed dental floss, by passing it between each of the teeth and sawing it backward and forward so as to cleanse the proximate surfaces of the teeth. Dental floss may be bought at trimming stores, rolled on cardboard, for one cent each. A stock of this may be laid in, and a roll given to each patient. A small bottle of your own "superior" tooth powder may also be presented, which costs the dentist but a trifle, and goes a great way in producing a favorable impression of your liberality as well as of your interest in your patient's teeth.

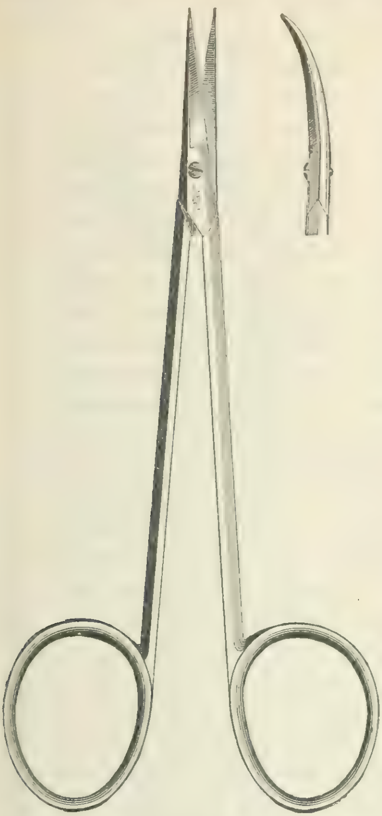

Fig. 7.

The next procedure will be the search for cavities of decay. The indications of decay are numerous. On the crown surfaces it is easily detected by black spots in the depressions or fissures of the enamel. Sometimes even in these places the dark spots are not present, but there may be a bluish tinge in the enamel, under which an extensive cavity may be found, or that tissue may only show a whitish, chalky, opaque spot, where the enamel is readily crushed in. Between the teeth the transparent bluish tinge or the whitish opaque indication is more frequently present.

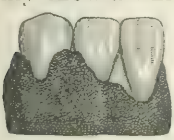

Fig. 8.

In your patient's teeth you find cavities in each of the lower six-year molars on their crown surfaces, and cavities in each of the same teeth in the upper jaw, on their crown surface also, as well as considerable other work. You proceed to fill the lower teeth first.

The first effort is to gain access. This is accomplished with enamel chisels. Those shown at Fig. 9 are very effective for the purpose. After the cavity is opened, and should decay be discovered in the

fissures, these may be followed out from the main cavity by fissure drills shown in fig. 10. The entrance being thus begun, the rubber dam is applied. This is accomplished as follows: The first procedure is to pass waxed floss between the teeth forward and backward of the tooth that is to be filled. A broad flange Tees' rubber dam clamp Fig. 11 is first tried on the tooth by means of the rubber dam clamp-forceps Fig. 12 to see that it fits well. This being ascertained, it is removed. A piece of medium rubber dam is taken, about 7 inches long and 5 inches wide. With the rubber dam-punch Fig. 13, a hole, the largest size, is made into it it about $3\frac{1}{2}$ inches from the end, and about 2 inches from the side. Through this hole the beaks or flanges of the clamp (Fig. 11) are passed, and the dam folded over the clamp-forceps, when it is placed in position on the tooth that is to be filled. The dam is now stretched *beneath* the flanges of the clamps with the aid of a ball burnisher Fig. 14. The dam is then held out of the way by means of rubber dam-holder Fig. 15, which is fastened to each side of the dam, and tightened by means of the slide on the back of the strap. To make it more comfortable for the patient a napkin may be folded several thicknesses and placed over the chin, letting the dam lay *on the napkin* instead of on the chin of the patient. Two light rubber dam-weights Fig. 16 may be fastened to both the dam and the napkin, which will hold the latter in place, and keep the former out of the way of the operator. The dam may be made to pass between the teeth

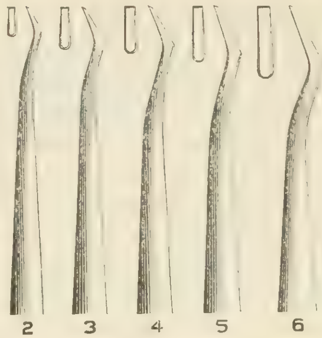

Fig. 9.

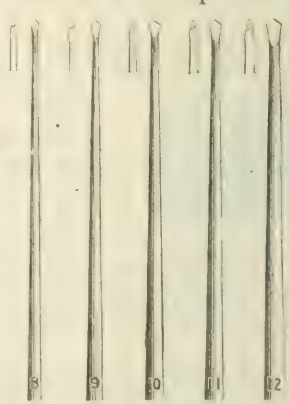

Fig. 10.

under the front part of the flanges of the clamp, by working a piece

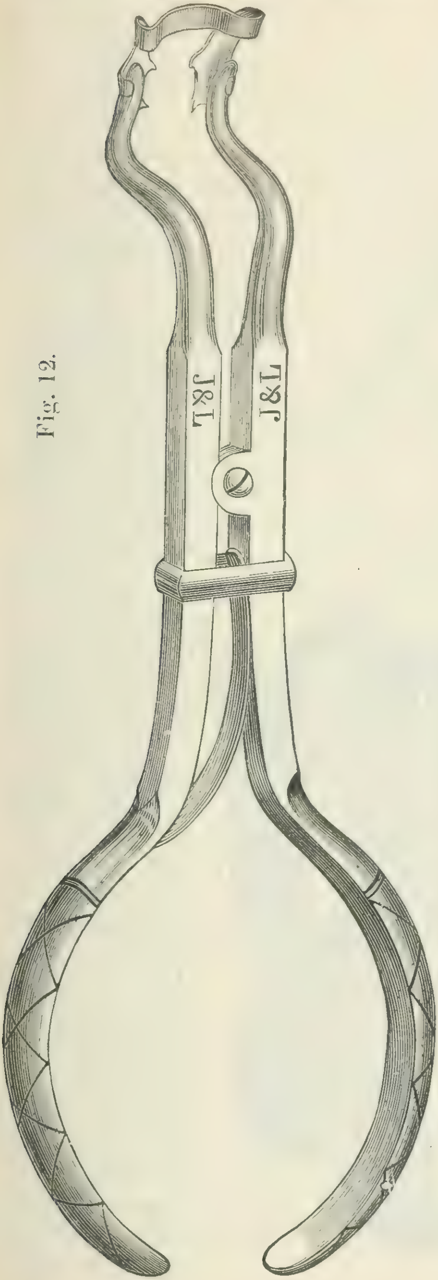

Fig. 12.

of waxed floss between the teeth, which will carry the rubber dam to the gum. The cavity is then made dry with

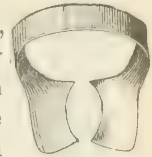

Fig. 11.

pieces of spunk or small pieces of bibulous paper, and a more definite shape given to the main cavity and its extending fissures, with burs used in the dental engine. When using the bur to clean out the cavity of decay or to give shape to it, it is well *always* to let some of the fingers of the right hand that are not used in directing the handpiece of the dental engine, rest on some of the adjacent teeth, because if this is not done, and the bur, while in violent revolution, should touch the rubber dam, it will so engage the dam as probably to tear it away from the tooth, or make such a hole in it as to necessitate its removal, and the replacing of another piece, When the decay has all been removed, the *edges* of the cavity are gone over with *fine-cut burs*, so as to give these a smooth margin against which the gold is to be packed. The best form for the cavity is *round*, but as this cannot always be obtained without removing too much tooth substance, we should approach as near to this form as possible.

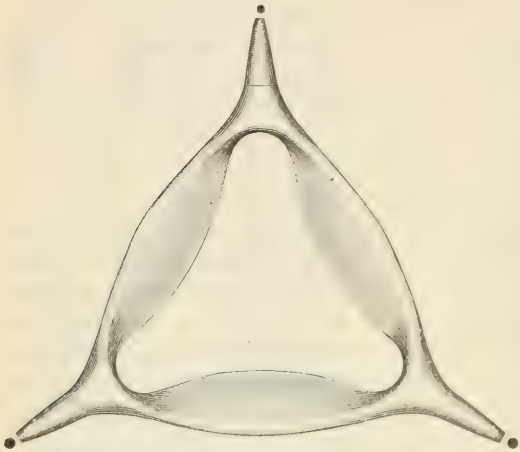

Fig. 13.

Should the cavity be very deep, so deep, indeed, that in attempting to remove all the decay over the floor of cavity there would be danger of exposing the nerve, it will be better to let this decay remain; but from the margins of the cavity *every trace of decay must be removed.* When the cavity is deep, as we have mentioned, we drop a little creosote or carbolic acid into it, and let this remain until we prepare our gold and get the pluggers ready to fill such a cavity. Then we take a piece of asbestos foil and cut a small disk of it of a size to cover the floor of the cavity. We then put this in place with the foil tweezers Fig. 17. It will absorb the greater part of the creosote which we had placed in the cavity. We absorb any surplus of it with small pieces of spunk or bibulous paper, after which we mix some phosphate cement pretty thick and *partly* fill the cavity with it. When this is hard we cut away a certain portion of the cement and shape the cavity

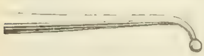

Fig. 14.

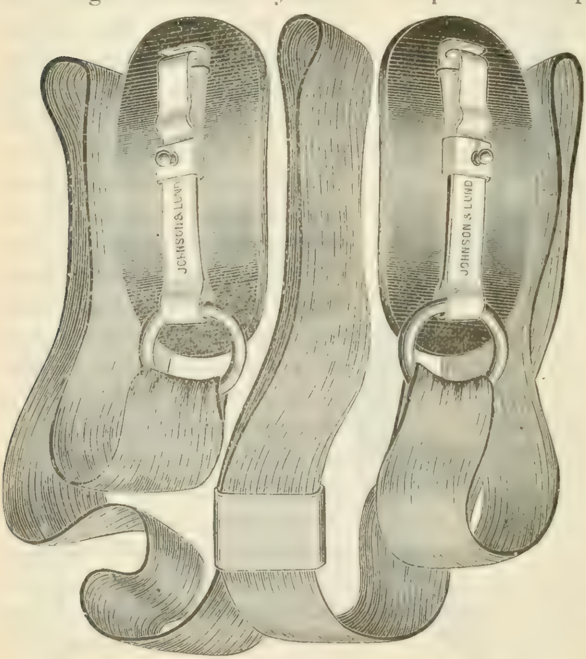

Fig. 15.

by slightly undercutting or grooving it for the retention of the gold.

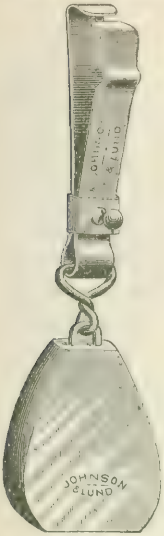

Fig. 16.

Fig. 17.

In Fig. 18 is shown the cavity in the molar under treatment, A being as it appears before touched by the chisels. At B is shown the same cavity prepared for filling. This cavity is very deep, and we proceed with it as we have described above. We introduce the gold either in pellets or cylinders, preferably the latter. One of these is placed against the wall of the cavity farthest from the operator, and lightly compressed with an instrument like Fig. 19, so as to make room for another cylinder; another and another is introduced, letting the cylinders rest on the bottom of the cavity and slightly protruding therefrom until it is pretty well filled. If the first or second cylinder does not keep its place, it should be held in place with an instrument, held with the left hand, until a sufficient number of cylinders are introduced, so that they keep their place without this help. When the cavity is thus filled, it is then condensed by pressing down all the gold that protrudes from the cavity, first with a broad-faced plugger like Fig. 20, and then successively with smaller faced pluggers like Fig. 21. If by this condensation of the gold it is found that the gold in the cavity sinks below the margin, it is brought up level by the addition of small pellets or cylinders of *cohesive gold.* Piece after piece of this is added to the gold already in the cavity until the cavity is slightly overfilled, and when the smallest faced plugger fails to make an impression or sink into the gold at any points over its surface, the gold is then burnished down, particularly around the margins of the cavity with brushers Fig. 22.

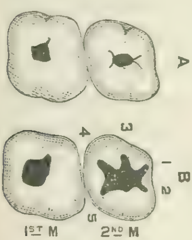

Fig. 18.

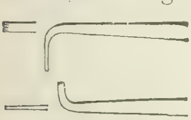

Fig. 19.

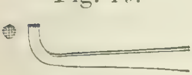

Fig. 20.

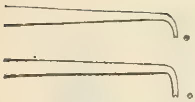
Fig. 21.


Fig. 22.

After the burnishing is completed the engine handpiece is armed with a mandrel, on which a small corundum point is mounted like Fig. 23, and this is used to cut down the gold even and smooth. The point is kept wet with water dropped on by means of a small pipet. This may be done either with the dam still in position or after it is removed. Before polishing the filling, the patient should be directed to close the teeth, when, if it is found that the upper teeth strike against the gold, the grinding should be continued until no mark is left on the gold by the antagonizing tooth. The filling may now be polished with a wood polishing point like either of these shown in Fig. 24, mounted in a porte polisher like either of Fig. 25. Fine pumice is used with water, and the gold reduced to a fine smooth surface, when the operation is completed. This will constitute the filling of one of the simplest cavities.

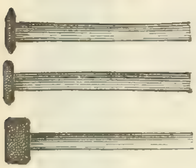
Fig. 23.


7. 6. 5. 3.
Fig. 24.

The next operation will consist of the preparation and filling of a cavity in which, from the main cavity, there radiates decays following the fissures. Such a cavity is shown in the second molar as shown in Fig. 18 (page 73). In the cut marked A, is shown the cavity untouched in the second molar. The overlapping enamel is crushed in by the enamel chisels, and the decay is followed out along the fissures either with hand fissure drills or fissure burs used in the handpiece of the engine. The cavity as thus prepared is shown at B, Fig. 18 (page 73) of the same tooth.

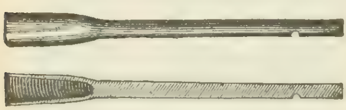
Fig. 25.

For filling such a cavity the gold is introduced into the fissures first, either the fissure numbered 1 or 2. In this case as in the other, the gold is left protruding from the margin of the cavity for after-condensation, as was described in the other case. The cylinder or pellet of gold thus used should rest on the bottom of the fissure cavity and protrude from its edges as shown in Fig 26, c.c., representing the cylinders placed in the fissures. These cylinders are introduced into these fissures with foil tweezers, such as is shown by Fig. 17 (page 73), and are slightly condensed by a backward push with a plugger like Fig. 28. When the fissures 1 and 2 of

Fig. 26.

the second molar B, Fig. 18 (page 73) are filled and pretty well condensed, until the filling brings the gold even with the main cavity, larger cylinders may be used, continuing the same procedure. To introduce these larger cylinders larger pluggers are used, such as is shown by Fig. 29. Should the cylinders not keep their place at first, assistance is rendered to this end by holding them in place with either one or the other of the instruments Fig. 30, held in the left hand until by a certain degree of wedging, by condensation, the gold is retained immovably. This introduction of large cylinders is continued until fissure No. 3 (B, Fig. 18, page 73) is reached. This fissure is then filled in the same way and with the same style plugger as was used to fill fissures No. 1 and 2, using, of course, smaller cylinders for the purpose. When this is accomplished large cylinders are again used until the cavity is filled up to its anterior margin, leaving only the two fissures 4 and 5 to be filled. These are filled in the same way as the other fissures. When all the fissures and the main cavity are filled, the protruding parts of the cylinders are condensed by going over the whole surface of the filling, first with a large-faced plugger, and decreasing the face surface of these until by the hardest pressure the smallest plugger fails to sink into the gold. Any point or pit that is left on the filling may be brought up level by the introduction of small or medium sized cohesive or annealed cylinders introduced into such pits and then thoroughly condensed. The hand mallet, the electric mallet, the engine mallet, the pneumatic mallet, or the automatic mallet may be used for condensing the gold. But while these instruments may be aids, or may somewhat lessen the time of the operation, the same result may be accomplished with hand instruments, by using *small points and small pieces of gold.* When the gold is so thoroughly introduced that no impression can be made on any part of its surface, it is then burnished down evenly, particularly along the margins of fissures and the main part of the cavity. The rubber dam may now be removed, and a small corundum point, mounted on an appropriate mandrel and placed in the handpiece of the dental engine, and kept wet by means of water dropped on it with a pipet, used to grind down or level the gold filling. When this is accomplished so that the gold is brought out to show both the main cavity and the fissures which have been filled, the patient is


Fig. 28.


Fig. 29.


Fig. 30.

directed to close the teeth and asked if the filling is touched by the antagonizing tooth. If the upper tooth touch the gold at any point, a bright mark at the point of contact will be left on the gold, and the small corundum wheels or points must be again used on the filling until the close of the teeth is normal; but if the patient still feels the filling, and yet no spot be left to indicate the point where it should be ground away, the point may be ascertained by directing the patient to close the teeth and use a grinding motion of the jaws, so as to leave an impression on the gold. Should this plan fail to reveal the point of undue pressure, a small piece of *articulating paper*, not quite as large as the entire masticating surface of the molar just filled, may be laid on this surface of the tooth. On the patient closing the teeth a black mark will generally be left on the gold, indicating where the filling is to be ground away so as to ensure the normal close of the teeth. (*To be Continued.*)

REMOVING NERVES WITH WOODEN POINTS.

By E. L. Hunter, Endfield, N. C.

If this method is properly and skillfully executed in its application to such teeth as offer favoring mechanical conditions, it is both expedient and painless. As a general thing it should not be undertaken with other than the incisors and canines. In some mouths, however, with proper shaping of the wood point, the second superior and both the inferior bicuspids, are amenable.

It does not in any case work so well in the lower jaw, as the natural yield under the blow prevents that quickness to which is due the absence of pain. Like everything else, to obtain the best results, it is necessary that all the means should be properly pointed and smoothly applied. One of the most important of these is a nearly, or quite direct, opening to the nerve canal as large as the pulp chamber, or larger, without any sharp or ragged edges. To do this it is very often necessary to enlarge outwardly from the pulp chamber. Much of the pain attending this part of the operation may be prevented by confining, for a few minutes, on the pulp a paste of cocaine and pure carbolic acid, and afterward using a new stoned burr quickly and steadily, with kind words and that assurance so essential when we must inflict pain.

When the nerve is fairly exposed, and the carbolic acid and cocaine paste have been applied, before enlarging the opening, make one quick dive into the pulp chamber (burr size of pulp chamber) having high speed on the engine cutting around the walls, so as to sever all

nerve fibre in the direction in which you wish to do subsequent cutting. If the paste has been properly applied, and the cutting in the pulp quickly done with a sharp burr, there will be very little pain in this preparation for entering the wood point. There should be no pain in driving the wood to the apical foramen. This point should be made from a piece of orange twig, having a straight grain, and be shaped with a sharp knife to such size, length and shape as to conform to the entire opening into which it is to be driven. The extreme point should be cut off in such way as to leave it too large to pass into the apical foramen, and driven home with *one dead* blow. Before doing so, however, the point should be soaked in *water* one minute. Withdraw the point with a direct pull, being careful not to give the slightest rotation.

If this operation was much more painful than it is, it would yet have much to commend it. No poison has been used; there is an entire and quick removal of the nerve, and the best possible condition for desiccation, and the promise of a longer life than from any other known method.

In conclusion I would say that it does seem a very small amount of thoughtfulness would prevent one from applying this method where it is not indicated, viz., very small, very flat, or tortuous canals, even where one had a right to *suspect* such condition.

I have used this method for nearly two decades with unvarying satisfaction and success. It is not original with me, nor do I know how old it is.

I am induced to write this as a crumb of usefulness to those who may not know of it, or, if they do, misapply it.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

(*Continued.*)

Q. What do you understand by what is popularly known as the tartar on the teeth?

A. It is a deposit of earthy and animal constituents that attaches to the teeth.

Q. From whence is it derived?

A. It is supposed to be an elimination of the saliva.

Q. Why is it called tartar?

A. Because it has a resemblance to a deposit found in wine casks.

Q. What is the name by which this deposit is also known?

A. Salivary Calculus.

Q. Is this deposit invariable in its appearance?

A. No. Its density, color, consistence and character vary in different temperaments.

Q. Of what use is it?

A. It has not yet been determined of what use it is to the economy, yet its characteristics furnish important diagnoses to both the physician and dentist.

Q. Of what is it composed?

A. Of earthy salts and animal matter.

Q. Where is the deposit most usually found?

A. On the inner or lingual surfaces of the lower incisors, cuspids and bicuspids, and on the outer or labial surfaces of the upper molars and bicuspids.

Q. Why should it select these localities in preference to others?

A. Because the teeth named are contiguous to the openings or mouths of the salivary glands of the upper and lower jaws, and, as we have said, it was eliminated by the saliva, these teeth become more coated with it because they are more profusely bathed with saliva.

Q. Do we notice any variations in the character of tartar?

A. Yes. In persons with good, strong constitutions, it is generally hard, black and dry, and the deposit is not excessive; such tartar is not readily dissolved in muriatic acid. In persons of bilious temperaments the deposit is light brown, chalky, easily removed from the teeth, and covers the teeth in large masses. This tartar dissolves easily in acid. In persons of lymphatic temperaments, the deposit is soft and white, and is scarcely acted on by acid at all, but readily dissolved by alkalies.

Q. Does the deposit of tartar decay the teeth?

A. No. Yet there is a kind of green stain, which is sometimes called tartar, which collects on the teeth of children (who are careless in cleansing their teeth) about the 10th to 13th year, which is exceedingly corrosive in its action.

Q. Is the health ever affected by the deposit of tartar on the teeth?

A. No bad effects have ever been observed by its accumulation. The effects are principally local, causing the gums to bleed profusely, forcing that tissue from the teeth, thereby causing them to loosen and ultimately to drop out, or to become so loose as to be an annoyance, demanding their extraction.

Q. What other effect do we observe from this deposit?

A. When permitted to accumulate in large quantities, it gives the mouth a most repulsive appearance, and the breath a most offensive and insufferable odor:

Q. How is this deposit prevented from accumulating?

A. By the vigorous use of the teeth in chewing the food, and in the careful brushing of the teeth.

Q. How is this proved?

A. Persons by habits, or in having a tender tooth on one side of the mouth, chew their food on the other. The teeth that are not used are usually found covered with tartar.

P. What effect has it on the gums?

A. It makes the gums so sensitive and painful that it is almost impossible to use the tooth brush.

Q. Should this deposit be permitted to remain on the teeth?

A. No; it should be removed.

Q. How is it removed?

A. With instruments called scalers.

Q. How are the instruments used?

A. They should be delicately shaped so as to pass readily between the teeth and under the free margins of the gums without wounding them, and the instrument passed beneath the deposit, when the tartar is carefully scraped off.

Q. May the operation be concluded in one sitting?

A. Ordinarily not. Several sittings may be necessary.

Q. After its removal what is necessary?

A. The patient should be instructed to use a gargle of astringent and cooling washes, and as the gums heal from this treatment, astringent powders and washes should be used to cleanse the teeth and gums with a soft tooth brush, to prevent the re-accumulation of tartar.

Q. What do you understand by the *Dental Pulp?*

A. The dental pulp is that soft tissue that lies in the centre of the teeth.

Q. How is it divided?

A. Into two parts. The bulbs or coronal portion, which is in the crown, and the canal portions, which are in the roots.

Q. Has the pulp any general form?

A. It partakes of the general form of the tooth, to which it belongs.

Q. Can you tell me something about the blood-vessels of the pulp?

A. In young teeth, before the roots are formed, the blood-vessels are very numerous, but as the apical foramen forms they become less and less numerous, until they diminish to two or three in number; but these divide again into innumerable capillaries, forming a complete network of blood-vessels within the canal portion and coronal portion of the pulp.

Q. Is there any difference in the size of the blood-vessels?

A. Yes. The veins are slightly larger than the arteries, and anastomose freely with each other.

Q. What do you mean by "anastomosing freely with each other?"

A. To anastomose is to communicate with, the inosculating of one vessel into another, as an artery into an artery, or a vein into a vein, or a vein into an artery; a kind of union by contact.

Q. How do the nerves enter the pulp?

A. Through the apical foramen in a single bundle. These slightly divide in the canal portion of the pulp, but in the coronal portion sub-divide in every direction, sending off filaments to the periphery.

Q. What is considered to be the office of the pulp?

A. Its physical function is the formation of dentine, as well as to maintain the vitality of the teeth.

Q. Has the dental pulp any particular manifestation?

A. Yes. It manifests very decided sensibility to thermal changes, yet there seems to be a certain association in these manifestations between it and the peridental membrane.

Q. Can you mention Dr. Black's experiment in proof of these manifestations?

A. A piece of rubber dam is placed (preferably) over an isolated tooth. Cotton is then packed all around the tooth tightly, and then another piece of rubber dam placed over the cotton, leaving about half of the tooth exposed. The clothing and face of the patient are protected, and a jet of iced, and then of hot water thrown against the tooth. The patient feels a sharp twinge of pain in both cases, but is unable to distinguish the temperature.

Q. What does this teach us?

A. That a diseased pulp should be shielded from these sudden thermal shocks, as in the heat generated by the too rapid use of the burr in the dental engine for excavating a cavity of decay, or in the too violent use of the sand-paper disk or emery strip in finishing a filling.

Q. Is there any way of determining a diseased pulp?

A. "As a rule, any pain in the region of the face or ear that is markedly increased by filling the mouth with cold or warm water, has its origin in disease of the pulp of a tooth."

Q. What do you mean by Differential Diagnosis?

A. "If the peridental membrane is inflamed, the tooth is sensitive to the touch and is not sensitive to reasonable thermal changes; while in acute and painful diseases of the pulp the tooth is sensitive to the touch; but is very sensitive to changes of temperature. Reflected or radiating pains do not occur in diseases of the peridental membrane without the pressure of a tooth that is sore to the touch. In case of

a reflected pain from disease of the pulp, the tooth is not sore to the touch."

Q. Is swelling occasioned by disease of the pulp?

A. No. Swelling is due to diseases of the peridental membrane, and not to the pulp.

Q. What do you mean by Hyperæmia of the dental pulp?

A. It means that the blood vessels of the pulp are congested or too much filled with blood.

Q. What are the causes of inflammation of the Dental Pulp?

A. The exposure of the organ by decay, abrasions of the teeth, mechanical violence, the indiscreet use of the burr in the dental engine in the preparation of a cavity for filling, etc.

Q. What are the symptoms of inflammation of the pulp?

A. The pain is dull, heavy and persistent, and is more inclined to be continuous rather than coming on in paroxysms. It is more liable, too, to come on at nights, when the blood finds easier access to the head in the recumbent position than in the day, when the patient is erect.

Q. Is inflammation of the pulp amenable to treatment?

A. Yes. The pulp will recover from inflammation if placed in a good hygienic condition.

Q. What is the cause of suppuration of the pulp?

A. When it becomes exposed to the fluids of the mouth by decay.

Q. Does the whole pulp suppurate from this exposure?

A. Not immediately; but little by little there is a breaking down of tissue until the whole organ becomes destroyed to the apex of the root.

Q. What is the peridental membrane?

A. It is a thin membrane which covers the roots of the teeth, serving to unite it with its socket or alveolus, and is analogous to the periosteum of the bones, though its functions and structure are different.

Q. Is the peridental membrane equally thick over all parts of the root?

A. No. At the end of the root it is thicker than on the sides or circumference, and consequently there is a greater space in the socket at this point than elsewhere.

Q. What is this space called?

A. The Apical space.

Q. Where does inflammation of the peridental membrane begin with its resultant alveolar abscess?

A. In the Apical space.

Q. Which precedes—inflammation or the death of the pulp?

A. The death of the pulp always precedes inflammation.

Q. What becomes of the blood-vessels of the apical space in alveolar abscess?

A. These are destroyed; but as the other blood-vessels around the gum border anastomose so freely over the alveolar rim, the membrane around the other part of the root does not suffer from the lack of blood.

Q. What office does the peridental membrane hold to the teeth?

A. It is the organ of touch to the teeth.

Q. How can you prove this?

A. The pulp being enclosed within the hard tissues of the teeth could not respond to the touch or to pressure. The pulp conveys painful impressions, and responds to thermal shocks, but it is the peridental membrane which responds to the touch. Cases are on record where, although the pulp was gone, and the peridental membrane of the apical space destroyed, yet the teeth responded to the slightest touch of the tongue or finger.

Q. What does this prove?

A. That the teeth are supplied with blood from more than one source, and that although one supply may be cut off, the tooth does not suffer materially on that account.

Q. What do you mean by traumatic pericementitis?

A. An inflammation of the peridental membrane resulting from injuries.

Q. What is Pericementitis?

A. The inflammation of the peridental membrane of the apical space, following the death of the pulp.

Q. What is Alveolar Abscess?

A. An abscess having its seat in the apical space, being the result of apical pericementitis, consequent of the death of the pulp.

Q. What is Gingivitis?

A. An inflammation of the gingival or gum border and lower portion of the peridental membrane, occurring mostly from constitutional causes, including salivation from mercury or other salivating agents.

Q. What is Calcic inflammation of the gums and peridental membrane?

A. A disease dependent on the deposit of calculus, salivary or serumal, on the necks of the teeth.

Q. What is Phagedenic pericementitis?

A. A specific infectious inflammation, having its beginning in the

gum borders, and accompanied with destruction of the peridental membranes and alveolar walls.

THE PRACTICAL PLACE.

AN EGG WITH WINDOWS.

A French scientist who removed the shell on either side of an egg, without injuring the membrane, in patches about the size of the diameter of a pea, and snugly fitted the openings with bits of glass, gives the following report of the wonderful experiment: I placed the egg with the glass bull's-eye in an incubator, run by clock-work and revolving once each hour, so that I had the pleasure of looking through and watching the change upon the inside at the end of each sixty minutes. No changes were noticeable until after the end of the twelfth hour, when some of the lineaments of the head and body of the chick made their appearance. The heart appeared to beat at the end of the twenty-fourth hour, and in forty-eight hours two vessels of blood were distinguished, the pulsations being quite visible. At the fiftieth hour an auricle of the heart appeared, much resembling a lace or noose folded down upon itself. At the end of seventy hours we distinguished wings and two bubbles for the brain, one for a bill, and two others for the forepart and hindpart of the head. The liver appeared at the end of the fifth day. At the end of 131 hours the first voluntary motion was observed. At the end of 138 hours the lungs and stomach had become visible, and four hours later the intestines, the loins, and the upper mandible could be distinguished. The slimy matter of the brain began to take form, and become more compact at the beginning of the seventh day. At the 190th hour the bill first opened and flesh began to appear on the breast. At the 204th the sternum appeared. At the 210th hour the ribs had begun to put out from the back; the bill was quite visible, as was also the gall bladder. At the beginning of the 236th hour the bill had become green, and it was evident that the chick could have moved had it been taken from the shell. Four hours more and feathers had commenced to shoot out and the skull to become gristly. At the 264th hour the eyes appeared, and two hours later the ribs were perfect. At the 331st hour the spleen drew up to the stomach and the lungs to the chest. When the incubator had turned the egg 335 times the bill was frequently opening and closing, as if the chick were gasping for breath. When 451 hours had elapsed, we heard the first cry of the little imprisoned biped. From that time forward he grew rapidly,

and came out a full-fledged chick at the proper time.—*Northwestern Magazine.*

The slow flapping of a butterfly's wing produces no sound, but when the movements are rapid a noise is produced, which increases in shrillness with the number of vibrations. Thus the house fly, which produces the sound F, vibrates its wings 21,120 times a minute, or 335 times in a second; and the bee, which makes the sound of A, as many as 26,400 times, or 440 times in a second. On the contrary, a tired bee hums on E, and therefore, according to theory, vibrates its wings only 330 times in a second. Marcy, the naturalist, after many attempts, has succeeded by a delicate mechanism in confirming these numbers graphically. He fixed a fly so that the tip of the wing just touched a cylinder, which was moved by clock-work. Each stroke of the wing caused a mark, of course very slight, but still quite perceptible, and thus showed that there were actually 330 strokes in a second, agreeing almost exactly with the number of vibrations inferred from the note produced.—*Northwestern Magazine.*

Miss Elderly—"I have just been gathering Autumn leaves, Mr. Oldboy." Mr. Oldboy (cynically)—"So I perceive, Miss Elderly. You have gathered them so many years I suppose you do it Autumnatically, as it were."

Ammonia as an Antidote to Cocaine.

Dr. Golovkoff reports in the "Proceedings of the Caucasian Medical Society," a case of cocaine poisoning in which treatment with ammonia was resorted to with excellent results. The ammonia was administered internally, and was occasionally also given to the patient to smell.

Before setting crowns wipe the gums around the root with a solution of perchloride of iron, which will prevent weeping, and the most important part of the cement will be protected until crystallized.—*Dr. L. E. Custer.*

The Sale of Practices.—The French courts have decided that a physician cannot legally sell his practice, on the ground that a medical practice is not an article of commerce. A contract to abstain from practising in any given neighborhood is, however, valid, and to be capable of enforcement at law.

Filing Glass.—The *Pharmaceutische Centralhalle* states that glass may be filed easily and without danger of breaking by dipping the file into strong soda lye, and then, while still wet, into coarse sand.

To avoid displacement of small pieces in soldering, by the frothing of borax, rub up with your flux and water on your slate a minute quantity of gum arabic.—*Carl J. Gramm, in Archives.*

Second Soldering.—When it is desired to solder a piece that has been soldered in another place, most gold workers consider it necessary to use a softer solder, which shall flow at a lower temperature than that first used, that the unsoldering of the previous work may be avoided. This is needless, if the solder used in the second case be placed in mercury until the surface is slightly amalgamated. If it be then used it will flow very readily, while the appearance of the finished piece is not injured, as the mercury is sublimated in the heating, leaving the solder as it originally was.—*Barrett.*

The Men who Invent are Thinkers; they are persons of adaptation and consecration; they are, and have been, benefactors to their brethren, and, as a rule, they suggest and give away to their co-workers little suggestions without money and without price, to make dental operations easy, more than all the money they receive for their patents. Inventions are the products of the brain, and they are just as legitimate as the labor of the hands. A certain orator was once asked how long it had taken him to prepare his oration; he replied, "just forty-four years, for I am just forty-four years old, and I have given my whole life to this work."—*Dr. J. A. Robinson, in Archives.*

Antipyrine as a Styptic.

The *Ohio Journal of Dental Science* mentions a case reported by a French physician in which a boy of fourteen suffered from persistent bleeding after the extraction of a molar tooth. Perchloride of iron was without effect, and so much blood was lost that syncope was induced. On recovery, the hemorrhage again broke out, and perchloride of iron was once more tried, but vainly. The cavity was then plugged with two or three pledgets of lint steeped in solution of antipyrine. The bleeding at once permanently ceased. It was noticed that while the perchloride caused severe pain, the antipyrine was not

not objected to. It was suggested that the antipyretic action of this and similar drugs may possibly be due to the fact that they diminish the blood supply by their astringent effect on the blood-vessels.

Nonsense Rhymes.

There was a young female named Idaa,
Who was fond of imbibing hard cida;
She took a large draught,
And then loudly laught,
For she saw several snakes and a spida.

There was a young man of Calai,
Who was handsome and gallant and gai;
His hair hung in curls,
And he mashed all the gurls,
And when the sun shone he made hai.

There was an old lady of Smyrna,
Who never had seen a gas-byrna;
So she blew out the gas,
The stupid old as,
And died of asphyxia—dyrna!

Violet Mouth Water.

The *Seifenfabrikant* gives the following:—

	Parts.
Tincture of benzoin	7
Tincture of rhatany	30
Tincture of myrrh	60
Rose water	250
Tincture of orris root	500
Alcohol	150

Thymol Dentifrice.

The following formula is given by the *Chemist and Druggist*:—

Precipitated chalk	15 ozs.
Soap, powdered	1 oz.
Saccharine	10 grs.
Thymol	15 grs.
Camphor	30 grs.
Vanillin	5 grs.
Oil of rose	6 drops.

Rub the camphor and thymol together in a mortar, and warm gently so as to render the mixture liquid; then add the chalk in small portions at a time, reserving about one ounce; next add the other ingredients, the perfumes being first separately rubbed with the remainder of the chalk.

To keep Rubber-dam from Slipping.

After the rubber is in place, and the teeth and rubber dried with napkin or bibulous paper, dust finely pulverized resin on the teeth and rubber. This will keep the dam in place, without other aid, in most cases.—*S. G. Welch, Lamingborough, N. Y.*

To Abort an Abscess.

℞. Ext. Aconiti, fl.............................)
Ext. Belladonna, fl............................} equal parts.
Ext. Opii, fl..................................)

M. Sig.—Apply with brush as needed to ease pain, also give fl. ext. phytolacca internally.—*Exchange.*

A Machine for Diagnosing Disease of the Lungs.

Berlin, February 27.—At a meeting of the medical society to-day Dr. Janiczewski showed an important invention called the pneumatoscope, which permits an exact differential diagnosis of all affections of the lungs. The instrument has two auditory tubes connected and with an ear piece for the physician. The inner tube has a swinging membrane which, when placed in the patient's mouth, registers the different irregularities of sound caused by disease of the lungs and the bronchial tubes.

Hint on Use of Arsenic.—Before applying for the destruction of a pulp, anæsthetize the head of the latter by holding in contact a pellet of cotton, dipped in hot carbolic acid. Most of dentists use too much arsenic. If the decomposed dentine is properly removed, and the pulp fully exposed, a small pin's head size of arsenic is sufficient. —*Dominion Dental Journal.*

"Catching" Points.—Get an air-tight case for keeping rubber dam in. Don't use rubber dam without washing in soap and water, and it makes it more agreeable to the patient to perfume it.

A bottle of cologne is a good thing to have about the cabinet. A spray to apply it is convenient.

It is much more pleasant to the patient if you will put a napkin between the dam and the lips.

BRIDGE-WORK.—Dr. King says: I have removed bridges that had been put on by the very best bridge-builders, and in regard to cleanliness, I have actually been obliged to hold my nose during the removal. The odor in some cases is unbearable. Besides this, we often have peridental inflammation resulting from irritation in wearing bridges. I advocate removable bridge-work.

OF THE MANY TEETH INTENTIONALLY DEVITALIZED, the percentage of cases that are thus really successful must ever remain unknown. To determine this a well-kept case book affords but little data. Thousands of devitalized teeth are to-day doing excellent and comfortable service, and may continue to do so for years, in which every element upon which success in treating such teeth is supposed to be based has been violated. Pulps have died under fillings—in many cases the sequence of pulp-capping—in some cases the tooth has darkened from infiltration of decomposed pulp-tissue, and yet, if the patient's testimony be accepted, there has been at no time the slightest discomfort, the change in the color of the tooth being the only observable indication of the change in its condition. These teeth are, of course, a constant menace. Nature simply tolerates them; they prove nothing beyond the fact that at times nature will tolerate a great deal with but little complaint. A slight change in the system or in the surrounding parts, a change in the patient's health or the local effects of a cold, may at any time set in motion pathological changes that will quickly result in alveolar abscess. This exciting cause being absent, for a long series of years this may be held in abeyance, and the tooth remains as comfortable and as useful as its better-conditioned neighbors.—*Dr. W. H. Trueman, in International Journal.*

A NEW OBTUNDENT.

A dentist in Iowa has recently patented a dental anæsthetic, or obtundent, which consists in compounding five grains of crystallized muriate of cocaine, six drops of chloroform, six drops of staphisagria, three drops of oil of cloves, and three drachms of water. These ingredients are thoroughly mixed, and produce a volatile fluid, and

can be applied locally and hypodermically for all the purposes for which an anæsthetic is adapted. To prevent pain in the extraction of teeth, five minims of the anæsthetic is injected into the gums on each side of a tooth before applying the forceps. It is stated that the addition of staphisagria greatly improves the compound as an obtunder.

Staphisagria is a compound Greek word, signifying "a grape," or "vine," and "wild," and it is supposed the drug mentioned above is delphinium (dolphin) stephisagria, the systemic name of stavesacre. The seeds have a disagreeable odor, and were formerly given as a cathartic, but their use has been discontinued, owing to the violence of their action. It is now chiefly used in powder to destroy lice and other insects; hence, by the vulgar it is called "louse-wort." We have had no experience in the use of this anæsthetic, but judge that a louse-wort squirt might assuage the pain in the tissues surrounding a departing molar.

As the smallest number of mankind are rich, and the largest number may be divided into those that are in moderate circumstances and those who are poor, and as all are subject to disease and accident, it follows that a doctor's fees are governed by these conditions. Discrimination in fees is, therefore, constant and necessary; whereas, discrimination in merchandising, if indulged in to any extent, would be ruinous. A doctor's first care is the good of his patient, regardless of his fees. A merchant's first care is his cash-book. A doctor is no more legally bound to give his services for nothing than a merchant is to give his merchandise; but public opinion—custom which is stronger than statute-law—says that a doctor who can help a poor man, and will not without a fee, has less of humanity than a poor ruffian who robs and maims a rich man, to supply his necessities. Public opinion says, with truth, that it is something monstrous to contemplate a man of liberal education tearing out the bowels of a poor family by taking, for one visit, what would keep them in food for one week: and this is why public opinion calls medicine, with all its specialties, a liberal profession. Public opinion can never be changed by manufacturing, wholesaling, retailing doctors, no more than it can be influenced by professional dandyism.—*John J. R. Patrick, D. D. S., in Archives of Dentistry.*

Proverbs and Quotations Respecting the Gentler Sex.

A woman's tongue is her sword, which she does not let rust.

On a mill, on a clock and on a woman there is always something to repair.—*French Proverbs.*

A man can defy public opinion; a woman must submit in resignation.—*Frau von Stael.*

Women do not know the value of a prudent person until they have married a stupid fellow.

Widows are like lights which have always burned—they catch fire more easily than others—*Saphir.*

A girl's innocence is like milk, which a thunderstorm, a poisonous vapor, warm weather, even a breath, can ruin.

The woman's mightiest weapons are gentleness and submissiveness.

To gain knowledge about women a person must have intercourse with women; to gain knowledge about men one must also have intercourse with women.

There have been more women ruined by women than ever were loved by men.

Love either forgives everything or nothing.—*Balzac.*

Men make laws, women make morals.—*Seyas.*

Women have no greater enemies than women.—*Duclos.*

The most charming object of nature is an amiable and virtuous woman.—*I. I. Rosseau.*

To marry for beauty is the same as buying a piece of land for the sake of the roses growing on it. The latter is even more sensible, for the rose-time returns every year.—*Kotzebue.*

Often marriage is like two drops of fat, which swim around on top of the water without ever flowing together.

No one in the world behaves with less politeness to women than women themselves.—*Jean Paul.*

A French woman loves to the end of the honeymoon, the English woman her whole life, the German woman forever. The French woman takes her daughter to the ball, the English woman takes hers to church, the German woman gives hers employment in the kitchen. The French woman has spirit and imagination, the English woman has little taste, the German woman modesty. The French woman chats, the English woman speaks, the German women renders decisions. The Spanish woman kills her lover in jealousy, the French woman her rival, the English woman herself, the German woman simply renounces. But all at some time marry some one else.—*Bogumil Goltz.*

Transmission of Tuberculosis.

Dr. Imlach, of Liverpool, who has given a good deal of attention to this subject, has come to the conclusion that consumption can be transmitted from cows to human beings through milk. His experi-

ments prove that guinea pigs, rabbits and monkeys fed on the milk of tuberculous cows develop tubercular disease.

Drosera for Phthisis.

A French homœopathist claims that drosera is a most valuable agent in the early stages of consumption. If given to patients inheriting the trouble it will never appear; if given when the trouble is well under way, it will quickly cure the existing symptoms and prevent further progress.

Restoration from Anæsthesia.

It is said that patients who have been over-anæsthetized may frequently be restored and their respiration aroused by the introduction of ice into the rectum. It is also said that when a patient is recovering from the effects of an anæsthetic, keeping the eyes closed will aid materially in preventing after effects, such as nausea, dizziness and uneasiness of the stomach.

To Clean the Teeth.

A. Gawalowski (*Oel und Fet. Ind.*) recommends rubbing black or spotted teeth with cuttle-fish bone made into a stiff mass by mixture with a 4 per cent. solution of hydrogen peroxide. After using, the mouth should be rinsed with water. In this way the teeth may be whitened in a few minutes, and it is said that the operation will not injure the enamel.

Equal parts of powdered charcoal and pumice, stirred into water till of a muddy consistency, and thickened with Plaster of Paris, makes a neat soldering block.—*Van Waert.*

HOW TO AVOID INDIGESTION OR DYSPEPSIA.

(Editorial in *Dental Headlight.*)

Of prime importance is the thorough mastication of food. This can only be accomplished by those who possess a good denture. See to it that the teeth and gums are in a healthy condition, and keep them so by regular cleansing. It is essential that the food shall be reduced to a comminuted state—a pultaceous mass—that the solvent and chemical action of the several digestive fluids may be efficient. A chemist first pulverizes solid substances before he subjects them to the action of the solvent menstruum. But in animals, digestion consists not only in reducing the food to a state of solution, but chemico-vital

changes are effected by the digestive ferments contained in the various secretions which are found in the alimentary canal. Hence it will not do to substitute these important fluids with water or other liquids. Take for example the saliva, which is so often substituted by other fluids, and so lavishly wasted by the average American.

Without discussing the well recognized solvent and diluent properties of the saliva, let us call attention to its other offices.

1. The saliva being an alkaline fluid, in accordance with the conclusion of physiological chemists, is the normal excitant to the secretion of the acid gastric juice. An alkaline substance applied to the mouths of acid secreting glands promotes their functional activity. The converse of this is true also.

2. The saliva possesses the power of aerating our food. By virtue of its viscid, frothy character it is endowed with the remarkable property of imprisoning innumerable globules of air, which are incorporated with the food during the process of mastication. Thus rendered porous, the food is readily permeated by the digestive secretions and its subsequent solution greatly facilitated.

3. By lubricating the dental and oral surfaces with its viscid coating, the adhesion of tenacious substances is prevented, and the food glides smoothly through the pharynx and esophagus into the stomach.

4. The saliva keeps the mucous lining of the mouth and tongue continually moistened; this condition is requisite to proper phonation and distinct articulation.

5. Taste is dependent on a sufficient supply of saliva. By solution in the saliva, the sapient elements of food are absorbed and brought in contact with the terminal filaments of the gustatory nerves. Substances insoluble in the saliva are devoid of taste.

6. The renewal of the air within the cavity of the tympanum is effected by the swallowing of a small amount of saliva. This phenomenon occurs at regular intervals, even during sleep.

From a late number of the *Medical Record* we extract the following, which still further demonstrates the importance of the saliva:

"Dr. George Sticker, who, in conjunction with Dr. Curt Hubner, has made some experimental studies on the physiology of the secretions, has recently published an article in which still more is claimed for the salixa than a purely amyloltic power. He believes this secretion taken into the stomach assists in the formation and secretion of pepsin, and thus indirectly assists in proteid digestion. A suspension of salivary secretion largely suspends peptic secretion also. He cites the case of a woman who suffered from an almost complete suspension of the salivary function.

"There was indigestion of both meats and carbohydrates. The re-establishment of the salivary flow by means of infusion of jaborandi relieved the stomach trouble also."

It is evident from the foregoing that many cases of indigestion are dependent on a failure to utilize this secretion. Mastication is the chief excitant of the salivary glands, the amount of saliva poured forth, and its incorporation with the food is determined by the thoroughness with which this process is performed.

Digestion is retarded by very cold or hot solids or fluids into the stomach. Digestion requires a temperature of about 100° F. for its proper performance. Many suffer during the summer season with a form of indigestion commonly known as "ice water dyspepsia." The ingestion of hot bread or other hot food is also equally deleterous. The process of digestion ceases till the contents of the stomach regain its normal temperature. The consumption of an excess of food or drinks, or an insufficient quantity, as regards bulk, are also potent factors in causing dyspepsia. Over distension paralizes the muscular wall of the stomach, whereas a lack of sufficient bulk, by a failure to excite muscular movements, is productive of atony. The peristaltic movements of the stomach, by bringing the food in contact with all parts of its secretory surface, and by its churning or triturative action on the food, materially assists in the digestive process.

Many dyspeptics make the mistake of eating but little food, and that of a highly concentrated character, being ignorant of the fact that a sufficient bulk is required to excite those muscular movements of the stomach and intestines on which good digestion is largely dependent. Others are slaves to appetite often insatiable; eating ravenously, notwithstanding the remonstrances of an already overloaded stomach. They consume food, not because the system demands it, but to satisfy a pampered taste; even resorting to condiments and stimulants to goad the already overladen and overworked stomach. No wonder they are, sooner or later, ready to say with an eminent writer, "I was a happy man till one day I realized I had a diabolical contrivance called the stomach." Till the vital organs become the victims of disease we are fortunately not conscious, by our subjective sensations at least, of their existence.

ACHING TEETH.

DR. W. E. TUCKER, BUTLER, MO.

A pulp exposed and aching, sensitive to cold air and water, I would not hesitate to devitalize by the application of arsenious acid,

except in rare and favorable cases; and where it is quite inconvenient for the patient to return, I remove the nerve immediately. This can often be done with little pain by driving a pointed stick or whalebone dipt in creasote into the pulp and removing it. If a tooth is aching from a confined and congested pulp, which will be indicated by its being sensitive to warm applications and relieved by cold, do not think of applying medicine, and especially an escharotic, for it will do no good; drill into the pulp and make it bleed, and you have instantaneous relief. Apply oil of cloves or eugenol if desirable, and afterward the pulp can be removed. In some cases it will be necessary to devitalize.

I depend more on the proper use of instruments and thoroughness of work than on remedies, though not ignoring the latter. The removal of a recently devitalized pulp is not always easily and quickly done. I would first, and always, after cleansing the cavity of decay, gain direct access to the root-canals. If that cannot be done through the cavity of decay, drill through the lingual or palatal surface, if one of the twelve anterior teeth. In bicuspids and molars direct access can usually be obtained by enlarging the cavity of decay till it comes directly over the root-canal. Fissure burs are useful for this purpose, and should be used in a right-angle attachment for the posterior teeth. If that is impracticable, drill directly through the crown of the tooth, being careful not to deface the floor of the pulp-chamber. If the tooth is one of the ten anterior teeth, either of the upper or lower, excepting the first superior bicuspid, the operation will be comparatively easy. Always apply the rubber dam and use the best and toughest instruments that can be had. I would not use a barbed instrument, except where the root is large and straight enough to insert it with perfect ease, as there is danger of breaking, and if one has an experience of that kind once, he will never want it repeated. Piano wire makes the toughest instrument I have ever seen. Take one of these with a small hook on the end, pass it down by the side of the nerve, turn it a little, and withdraw. If that does not bring it away, try it again and again. If it still refuses to come, wind cotton on a fine broach, pass it into the root, rotate, and withdraw.

Sometimes it is necessary to use creasote or ninety-five per cent carbolic acid to allay pain, or stop bleeding; it also helps to bring away the pulp. After its use I would wash the cavity with alcohol, to remove the escharotic effect. I dwell on this part of the operation because it is often difficult, and imperfectly done. Sometimes a part of the pulp remains and is forced up to the end of the root, and we think it is out. It sometimes requires a delicate sense of touch to tell

that there is a remnant of the pulp in the canal; so I would say, keep on till you feel sure of its removal. Don't be misled by any dental writers who will tell you, "That little nerve will never amount to anything; just saturate it with eucalyptus and iodoform, and you will never hear from it again." If you become tired and discouraged, dismiss your patient and have him come some morning when you are fresh, and try again. In very small canals, such as those in buccal roots of upper, and anterior canals of lower, molars, fine Swiss broaches, with temper drawn, are useful. In posterior teeth little reamers and broaches made of piano wire, $\frac{7}{8}$ to 1 inch in length, are invaluable, manipulated between the thumb and finger; you can obtain direct access, and give them the rotary movement so necessary in cleansing root-canals. One should become expert in winding cotton on a smooth broach, for it is sometimes necessary to change the cotton many times in treating a single tooth. Probably every one now knows how it is done, but they did not a few years ago. I saw one of the most ingenious dentists in the State of Missouri fail several times in making the attempt. It is done by laying the fibers of cotton along the broach, extending from the point about an inch; at this place grasp the broach and cotton firmly with the thumb and finger of the right hand, with which turn the broach and cotton rapidly, letting them slip between the thumb and finger of the left hand. After the pulp has been thoroughly removed, bathe the canal with eugenol, which will penetrate and embalm the contents of the dental tubes. The tooth is now ready for filling. For root-filling there is no other material having so many advantages as gutta-percha; it is indestructible and easily manipulated. A chloroform solution of gutta-percha, with the addition of a little iodoform, should be worked into the canal with a small broach till about full; then take a gutta-percha cone nearly as large as the canal and force into it till felt by the patient; that is evidence that the root is full. Very small and crooked canals cannot be filled with gutta-percha cones; in those cases 20 or 22 k. gold wire must be substituted, determining the size and length by the broach used in cleansing the canal. As to the best time to remove the pulp after applying the arsenic, that depends on circumstances, and sometimes on the patient, for with some, the application will need to be repeated. It is often advised to wait a week or ten days, for the dead pulp to separate from the living, but my experience does not justify me in following that course. There are about as many pulps painful at the end of one or two weeks as the next day after the application is made; hence I usually find no advantage in waiting, but fill the tooth the next day if it suits my convenience and that of my

patient better than to wait. If the tooth should be sore the next day after being filled, paint the gums with tincture of aconite and iodine, equal parts. Capsicum plasters are quite convenient, and in many cases effective. If trouble is anticipated, the patient can be supplied with them before leaving the office.—*Western Journal.*

Boil the Drinking Water.—Against those diseases which cause the most deaths in Michigan there is a practical remedy in the hands of every man. I told you how that dread disease, typhoid fever, which kills a thousand citizens of Michigan each year, most of those in the prime of life, is spread by the germs in the water we drink. Now what will destroy these germs? Freezing the water will not do it, but boiling the water will do it. Robert Elsmere preached a good religion when he preached the necessity of boiling all drinking water. Nothing so easy, nothing so potent. Filtering the water will not destroy these germs. It only takes them prisoners, and when the prison is overcrowded, the filter itself becomes a distributer of germs. Boiling the water one half hour will destroy them. In view of this fact, some one has declared every death from typhoid fever to be suicide or homicide, and if there is any one thing I would emphasize to-night, and have remembered when I have done, it is this simple precaution: Boil the water, boil it when typhoid fever is prevalent, boil it at the time of year when typhoid is expected, boil it if you have any suspicions about your well, boil it any way. You will hear many precepts at this convention, some, perhaps, which you will forget, but I shall be satisfied if the enthusiasm of this convention reaches the boiling point. The germs of these other diseases: diphtheria and scarlet fever, enter the lungs through the air we breathe. What will destroy these germs? You may have heard of many disinfectants, but experience in this state has proved that the ——?
—*Dr. A. A. Clark, Lansing, Mich., in Sanitary Volunteer.*

A great point has been advanced in reference to this "boiling of all the water" used for drinking purposes. Now while we are not opposed to the procedure, we would rather advise a step farther. What is the object of boiling the water? It is answered to kill the germs. Does this really get rid of their pernicious effects? We say no; for by simply boiling the water we may destroy the live germs, but we *make a soup* of millions of dead germs, which still remain in the water; and who knows but what these dead germs may have as deleterious an effect on the system as the live ones? We have been told that as many cases of typhoid fever has been traced to the drinking of boiled as to unboiled water. We would suggest that besides the boiling that the drinking water *should be filtered.*—Ed.

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OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S.

(Continued from page 76.)

It will scarcely be necessary to go over the ground of filling a cavity in either of the upper molars, whether such of these teeth have cavities, simple, or compounded with radiating fissures such as we have described, as the mode of procedure will be exactly the same. There is a decay which frequently is found in the upper molars, such as is shown in Fig. 31.

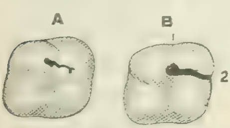


Fig. 31.

A, of this cut, showing the decay as revealed in the mouth mirror. Ordinarily it will be found that the main cavity is quite deep, while the fissure, which runs along the masticating surface, terminates close to the gingual margin on the palatal aspect, is quite shallow. B, of this same cut, shows the cavity prepared for filling. In preparing such a cavity for filling, the palatal terminus of the filling (2 of B, Fig. 31) should have a moderately deep retaining pit. To fill such a cavity, the main cavity No. 1 (of B, Fig. 31) should be filled nearly full and thoroughly condensed ; when the retaining pit No 2 (of B, Fig. 31) is next filled full, with cohesive gold ; the shallow fissure between the main cavity and the retaining pit is then filled by bridging the space between these points, using cohesive or annealed gold to do this. The pluggers used for filling a cavity of this kind will be different from those used for filling a cavity in the lower molars, in that they will be straight, slightly bent or bent at right angles, for the easier approach to the cavity. The student should endeavor to use only such instruments as are straight or nearly so, except indeed the right and left pluggers for

proximate cavities. Fig. 32 will illustrate such pluggers as will apply well for the filling of the cavity we have described.

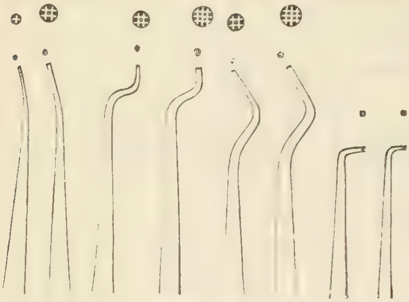


Fig. 32

A cavity such as this, may be entirely prepared with burs and drills in the dental engine. A small fissure bur like Fig. 33 will open the cavity. Once opened, the orifice is increased in size with larger fissure burs. When sufficiently enlarged to admit of their use, an oval or round cavity bur like Fig. 34 may be used, increasing the size of these burs as the decay is found to burrow into the dentine. The fissure running from this main cavity is prepared generally with small fissure burs, of such sizes as are found applicable to the case. When the decay is *all* removed, the edges (or borders) of the cavity are made smooth with *fine cut* burs. Fig. 35 will illustrate such of these as will be found applicable for a case of this kind.

66½.

Fig. 33

Where the decay in an upper or lower molar is so boldly revealed as not to require any exploring probes to find it, it is not prudent to use chisels to crush down the overhanging enamel, for frequently the underlying decayed dentine is so soft and so extensive, that the thrust of the chisel, even though it be well guarded, will perforate this softened decayed mass down to the pulp; but even if this should not happen, the entrance of the chisel into the abnormal tissue often causes considerable pain, which can and should be avoided. It is our custom to open such cavities well by the use of a small corundum point (Fig. 36), used on the dental engine, grinding away, instead of crushing in, the overhanging enamel. When a good strong border or margin is thus obtained, the rubber dam is applied.

3 4 92.

Fig. 34

Clamps for use with the rubber dam should only be regarded as adjuncts or assistants for its application, and whenever these can be dispensed with they should not be used, as they cause pain, discomfort and uneasiness, and add to the nervous shock or strain on the patient. Besides this, by removing the clamps (as we shall presently describe) the patient is enabled to close the mouth and swallow the accumulating saliva, and thus relieve himself, which he could not do if the clamps were

243. 200.

Fig. 35

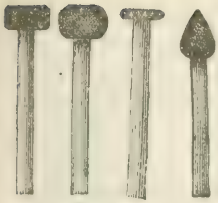


Fig. 36

kept in place during the whole operation. It is true that some teeth are so shaped that the rubber cannot be held in position except by aid of the clamp, but in the large majority of instances it may be removed.

It is our custom, generally, to enclose *three teeth* by the rubber dam. Especially is this the case when we observe decay in the adjoining teeth to the one, the opening of which we just described. We do this for a purpose. First, should the large cavity be very sensitive to prepare, we can mitigate this in a great measure by letting it *dry thoroughly* while we prepare and fill one or both of the cavities in the bicuspids, shown in Fig. 37. Secondly, by enclosing more than one tooth, the dam is kept better out of the way of the operator, and his view and manipulation is less trammelled.

Fig. 37

After the cavity in the molar is opened by means of the corundum points, the dam is punched, as shown in Fig. 38. The cut represents a piece of rubber dam, 5 inches wide by 8 inches long, and the holes are punched in the same relation as to size, as is shown in the cut. The holes are ordinarily punched one-eighth of an inch apart. When any tooth is missing, and it is necessary to bridge the space over the gum space, it will be necessary, of course, to allow a compensating space for the lost tooth, otherwise the dam will not hug the tooth sufficiently tight to exclude the saliva. Through hole No. 1 of Fig. 38, we pass the flanges of a Tee's broad flange rubber dam molar clamp. Gathering up the dam over the ends and handles of the clamp forceps, we place this over the molar tooth, being careful that it does not pinch the gum. Next, we stretch the dam beneath the flanges of the clamp, first on its buccal aspect, then on its lingual, with a small ball burnisher bent at right angles, or with any instrument that will not cut or tear the dam. Then we stretch it over the second bicuspid and lastly over the first bicuspid. In a ligature of waxed dental floss we make a knot. Passing the ligature through both proximate surfaces of the *first bicuspid*, so as to let the knot rest on the lingual aspect of the tooth, we tie the tooth. In making the tie on the *outside* we *double* the ligature, as shown in Fig.

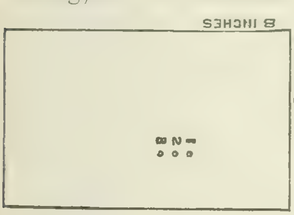


Fig. 38

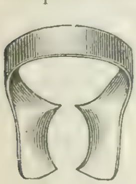


Fig. 39

Fig. 40

40, so that when the final tie is made, the ligature is not drawn away from the tooth. Before making the final tie, we hold the two ends of the ligature with the fingers of the left hand and with a bent plugger, like Fig. 41, resting on the knot on the *lingual surface*, we push the ligature down to the neck of the tooth. This carries the dam before it; we take up any slackness this manipulation may have caused in the ligature and make the final tie. We ligate the second bicuspid in the same way. We desire now to remove the clamp which we had only used as an aid in the application of the dam. For this purpose we make quite a large knot, about the size of a number 6 bird shot, in the waxed ligature. We pass one end of the ligature behind the bow of the clamp, so that the knot will be on the lingual surface of the tooth. Sawing the ligature back and forth, we gently carry the dam down between the first and second molars, then we pass the ligature beneath the flanges of the clamp, first on the inside next the tongue, and then pass it through the proximate surface of the molar and bicuspid, insinuating the dam down to the neck of the tooth; then make the tie with a knot, as shown at Fig. 40, letting this go beneath the flanges of the clamp on the buccal part of the tooth. Holding the ends of the ligature in the left hand, and lifting off the clamp, with clamp forceps, in the right hand, the slack in the ligature is taken up, and the tie made. Although it has taken some time to describe how to apply the dam thus, we can go through this application, over three or four teeth, in from five to six minutes. To make the patient as comfortable as possible, a napkin is folded several times and placed on the chin beneath the dam, and this is held in place by means of a couple of small clamps, such as are used to hold the cuffs to the wristbands of the shirt.

Fig. 41

The dam being applied, we wipe away any moisture that has found its way around the teeth with pieces of spunk or bibulous paper. The large cavity in the molar is then made as dry as possible, and the softened decay is carefully removed with large spoon excavators, like Fig. 42. This generally comes away in leathery folds or pearings, and has the appearance of being soaked with moisture. When this excavation begins to give pain it is well to desist. Drive out as much moisture as you can with the hot air syringe, but if this should give too much pain, place a drop or two of chloroform in the cavity, and leave it alone until this all evaporates,

Fig. 42.

which it will soon do. While the chloroform is evaporating, turn your attention to one of the cavities in the bicuspids, and prepare this thoroughly for filling. By the time this is done, the chloroform will be entirely evavorated from the cavity in the molar and this left pretty dry. A little more preparation of molar cavity may be made until pain is again felt, when the cavity may now be filled with a drop or two of *absolute alcohol.* This is permitted to remain in the cavity until the bicuspid cavity has been filled with gold. The affinity which alcohol has for water will rob the dentine of the molar cavity of its moisture, but if this has not evaporated by the time it has taken to fill the bicuspid cavity with gold, it may be still permitted to remain, and the cavity in the other bicuspid (Fig. 37) prepared and filled. By this time all the alcohol will have evaporated, and the cavity be quite dry. If there be any suspicion of moisture left, however, it may be driven off with the warm air syringe. Make no attempt to remove any more of the softened decay over the nerve on the floor of the cavity in the molar. Put *one drop* of creasote in the cavity, and cut a small disk of asbestos foil the size of the cavity and put this in, laying it evenly and neatly over the entire floor. It will absorb much of the creasote, and all excess of this may be removed with small pellets of bibulous paper. Then mix, not too stiff, some Phosphate of Zinc cement and fill the cavity with this, introducing a little at a time, on the end of a small spatula, packing it away into all parts of the cavity with large ball end burnishers or amalgam pluggers. These should be dipped into some of the powder (or oxide of zinc) to prevent that which was introduced from sticking to the instrument When the cavity is filled, it may be coated with a film of sandarac varnish. The rubber dam may now be removed, as fully one hour and a half will have been consumed in completing the operations we have described. At another appointment the molar cavity can be filled with gold, by cutting away a portion of the Phosphate of Zinc filling and capping this with gold.

The operations we have thus far described have been those of the simplest character, as they have been all where a direct view and a direct approach to the cavities were possible.

On the proximate surfaces of the teeth a direct approach and view

is not always possible, but it should be the aim of the operator to make the approach and view as direct as possible.

Formerly the only means available of gaining room, whereby the proximate surfaces of the teeth that were affected by decay, was either by making permanent separations between the teeth with the file in the hands of the operator, or the corundum disk in the dental engine, or by forcing the teeth apart by the use of wedges, tape, cotton floss or rubber. These agents were not always effective, and sometimes caused a great deal of suffering. This was especially the case when rubber was used; for it frequently happened that the rubber would work its way between the teeth and lodge next the gum, against which it pressed, keeping up an irritation that few patients could endure; and the pain was so unbearable that patients would remove the rubber, and, of course, if the teeth *had* been separated, its removal would only permit the teeth to return to their former position, in close contact, so that when the patient came to fill his appointment, the case was in no different condition from what it was before the rubber was applied. Even were the teeth separated by the rubber, they were generally so tender and sore that little could be done to them without inflicting, not only pain from this soreness, but pain in the excavation of the cavities, and to allay this soreness, the space gained by the action of the rubber had to be maintained by packing softened red gutta percha between the teeth and letting this stay in place for a day or more until the soreness subsided. This mode of procedure not only caused considerable delay in the execution of the work, but was frequently attended with inconveniences to both patient and operator.

The subject of *immediate separation* of the teeth has long been fully discussed; but the subject was one that the dentist felt was of much moment both to his patient and himself.

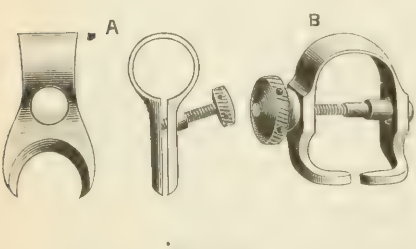


Fig. 43.

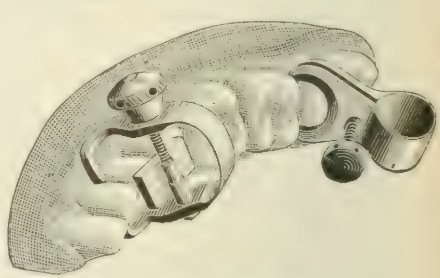


Fig. 43--C

To Dr. Jarvis is due, we believe, the honor of first devising a set of instruments (which were known as "The Jarvis Separators"), by

which the prompt or immediate separation of the teeth could be effected. Fig. 43 represents two of his separators. Of the style A, there were *three sizes* which were designed for separating the molars and bicuspids, while B was designed to separate the oral teeth. C represents the manner in which they were applied for the purposes intended.

While these devices were capable of accomplishing the separation of the teeth, it was impossible to work on the teeth while they were in position. The mode of procedure being to place wedges between the teeth thus separated, so as to hold them in their new positions, and thereby not only to have access to the cavities of decay between the teeth, but to give the operator the chance to approach, to excavate, to prepare and to fill the cavities thus exposed to view.

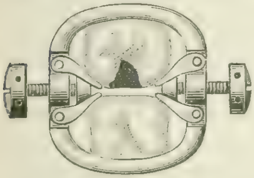


Fig. 44.

While this was an acknowledged advance on the old manner of wedging by rubber, cotton, tape, &c., it did not entirely fill the bill, so that other minds worked in the same groove. Dr. W. A. Woodward, Dr. H. A. Parr, Dr. S. G. Perry and Dr. G. Morey have each given to the profession separators, by which, not only may the teeth be separated, but by which operations on the teeth can be accomplished without resorting to the removal of the separator until the work is accomplished. Fig. 44 represents Dr. Woodward's device and its mode of application. Fig 45, Dr. Parr's; Fig. 46, Dr. Perry's, and Fig. 47, Dr. Morey's.

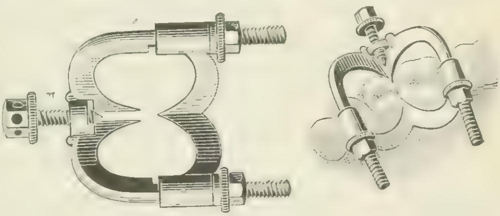


Fig. 45.

Separators were not taken hold of with avidity, as it was generally thought that they would give too much pain, but almost the unanimous verdict of patients is that they cause but little discomfort. By the aid of the separator, children may have their four incisors separated and filled with gutta-percha (six cavities) *at one sitting*, which by the old plan of wedging not more than two cavities could have been accomplished at one time.

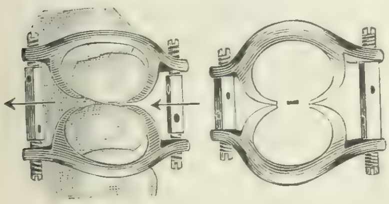


Fig. 46.

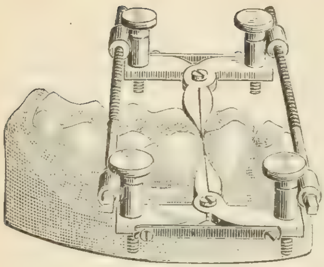


Fig. 47.

Decays being discovered between the central incisors, the first procedure will be the application of the rubber dam. A piece of waxed dental floss is first passed between the right lateral and central incisors, between the two centrals, and between the left lateral and central. Four holes are punched, about *one-eighth of an inch apart*, in a piece of rubber dam 5 inches wide by 8 inches long, about $1\frac{1}{2}$ inches from its upper border, and equi-distant from its sides. This is stretched over the teeth. one hole at a time, until the four incisors are enclosed. The floss is now passed between the teeth, as before, so as to carry the dam well up to the neck of the tooth. A knot is made in the ligature, and this knot is made to lie on the *palatal aspect* of the teeth. The two ends of the ligature, which come forward, are tied in a knot such as is represented at Fig. 40. Resting the left hand on the patient's head, with the two ends of the ligature in the fingers of that hand; the point of an instrument in the right hand, such as is represented at Fig. 41, is placed on the knot at the palatal aspect of the teeth, and the ligature is pushed gently and steadily upwards, so as to carry the dam before it. When by this manipulation the dam is insinuated well on to the neck of the tooth the ligature is firmly tied on its labial aspect. We will say here that by doubling the ligature *twice* as is shown at Fig. 40, the knot will not slip or pull away from the teeth when the second tie is made. Each of the four incisors are tied in the manner described above. Thisbeing accomplished, a napkin is placed over the chin of the patient, and this is secured on each side, to each edge of the dam by means of small clamps, such as are shown at Fig. 48. The rubber dam holder, Fig. 15, of the last paper is then attached to the dam next the cheek of the patient, the strap carried around the head, the other edge of the dam caught by the holder, and the strap tightened by means of the slide on the back part of the strap.

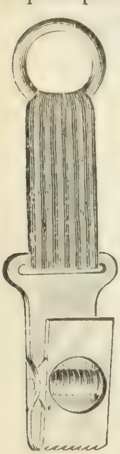


Fig. 48.

While this style of rubber dam holder is most generally used, we much prefer one such as is illustrated at Fig. 49. Any dentist can make one of these for himself, and if the bars are made from $3\frac{1}{2}$ to 4 inches long, they will keep the dam well out of the way of the operator, and be no more inconvenient to the patient than the other style of holder. It consists merely of two brass rods soft soldered to

two brass plates, of a form as shown in the cut. The ends of the strap are sewed to the holes left in the plates, and the strap is tightened by a slide simiiar to what is used in the other holder. The plate and bars can be made in a half hour. These arrangements being accomplished, the separator is applied so as to force the two central incisors apart, in each of which teeth decay is found to have commenced its ravages. Should the operator have the Perry separators, he will select one of these which will most accurately fit the teeth to be operated on; as these devices are *not universal*, but are made to act on each class of teeth. Should he use the Parr or Morey separator, he will apply either of these devices, with the object of forcing the teeth apart. Any of these devices should be applied so that the impinging jaws do not press on the gum and thereby give pain. Of these devices we would say that the Perry separator is the least cumbersome, though the most expensive; with it the whole operation may be accomplished without the least hinderance; it assists in keeping the dam out of the way and offers no impediment to the operator's view or manipulation. Its mode of application is at times difficult, that is, in spreading the bar *within the mouth*, and on account of the diversity in the sizes and shapes of teeth, requiring a number of these to suit the case in hand.

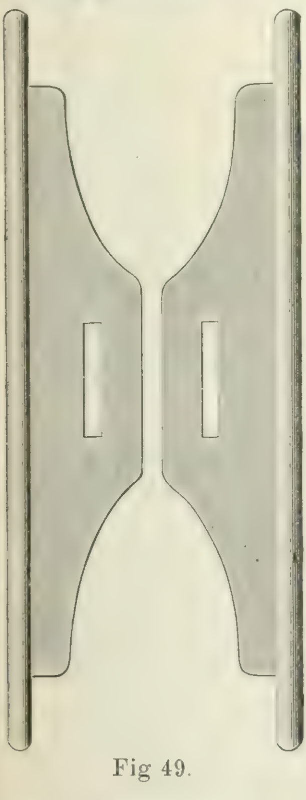


Fig 49.

Dr. Parr's separator is *universal*, that is, one device is used to separate any two of all of the teeth. Its mode of application, especially in the back teeth, is also faulty, from the difficulty of applying the wrench to the nuts *within the mouth*, as also on account of its size

Dr. Morey has overcome, in his separator (which is also *universal*) the difficulty of application, as his device is worked entirely from the outside of the mouth, but it is opened to the objection of size.

Having applied then a separator to the incisors, these teeth are gradually forced apart by a steady and intermittent pressure on the screws. A space amply sufficient to enable

the operator to work on the decayed teeth, may be gained in from 5 to 10 minutes. This pressure may be carried too far, but a careful operator will be watchful of this. A space the size that will admit a No. 6 separating file will be *amply sufficient*; and in many cases, less space would answer.

After the teeth are separated, it is a good plan to pass a piece of emery polishing tape over the sides of each decayed tooth. This will bring out the decayed spots in better relief, and will also smooth down the edges of the cavities. The cavities are then excavated. The head of the patient should be thrown back, so as to approach these places from the palatal aspects of these teeth. Small excavators such as are shown in Fig. 50 are used for this purpose. The cavities being prepared with these instruments, a small *fine cut round bur* in the dental engine, may be used to smooth the margins of the cavity.

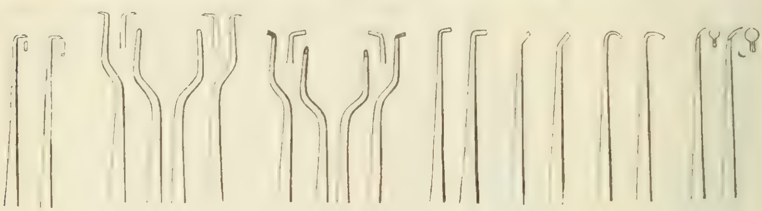


Fig. 50.

Some operators prefer to make a groove at the cervical part of the cavity for the starting of the filling, others prefer to make a retaining pit. We prefer the latter. The retaining pit need not be deeper than the $\frac{1}{64}$ part of an inch. The retaining pit should be drilled *into the dentine*, near to, but not touching the enamel, and in a position and direction that will not encroach on the pulp.

The pit is started by means of very small spear-shaped drills like Fig. 51, or it may also be made with one of Dr. Parmlee Brown's retaining pit drills represented in the same cut. It will be understood that when a hole is drilled by a spear-shaped drill, the drill leaves a depression such as is shown in Fig. 52 A. If gold be packed into such a retaining pit, the chances are that it will not stay, but will drop out. But to make it stay, without drilling the pit deeper, we make use of an instrument such as is shown in the same cut B. By carrying the cutting head of this instrument into the pit the spear point depression is obliterated, leaving a pit such as is shown at C of the same cut. In such a pit the gold will readily stay. The cavity should be grooved around the *entire circumference*, when practicable, by means of small *hoe excavators* such as are

161.

Fig. 51.

shown at Fig. 50, and this groove should be well defined towards that part of the cavity nearest the cutting edge of the tooth with a *hook excavator*, Fig. 50. In Fig. 53 is shown the shape of the cavity, A representing the depression towards the cutting edge, B the retaining pit.

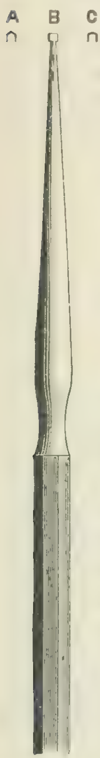


Fig. 52.

Fig. 53.

We have found that the best form of gold to fill the retaining pit, as well as the cervical margin of the cavity is Watt's crystal gold, No. 2. This is *torn* off from the cake in very small pieces. No piece should be larger than will enter the cavity without being compressed. The retaining pit is first filled with a finely serrated plugger like Fig. 54. More gold is added to this, piece by piece, until the pit and cervical margin are filled. This should be well condensed, and a plugger like Fig. 55 will be found to apply well Piece after piece of this gold or foil in small pellets or foil in cylinders are added to this, condensing thoroughly each piece before another is added and a pair of right and left pluggers such as are shown at Fig. 56. will be found to apply well. Should the cavity be large, such right and left pluggers as are shown at Fig. 57 will apply to better advantage. By this time, two-thirds of the cavity will have been filled, so that the gold will have been brought down nearly to the groove towards the cutting edge of the tooth; shown at A, Fig. 53. This is now filled loosely at first with a plugger like that shown in Fig. 58. When the gold which is packed into this groove is brought upwards, until it unites with that which was packed into the upper part of the cavity, it is then well condensed, and more and more added until the cavity is a little more than full. The whole filling should be gone over, particularly around its borders or margins, to see that there is no sinking of the gold under the pressure of the plugger. Small pointed pluggers in shape such as have been recommended, should be used for this, and wherever a soft place is found gold should be added at that point. When the filling shows no defects of this kind, a piece of gold (we prefer a cylinder) sufficiently large to cover the

Fig. 54.

Fig. 55.

Fig. 56.

Fig. 57.

entire surface of the filling is laid on, and this is united to it with a burnisher, like Fig. 59, and the whole surface of the filling pressed down with the burnisher. The excess of gold is then removed either with emery polishing strips or sand-paper disks in the dental engine, and the gold left smooth and flush with the surface of the tooth. A brilliant polish should be left on the gold, which may be done with crocus polishing strips or with crocus disks in the dental engine.

Fig. 58.

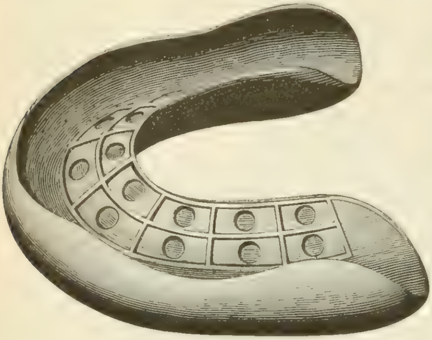
Fig. 59.

(TO BE CONTINUED.)

A NEW FORM OF PLATE FOR ARTIFICIAL TEETH.

BY J. R. WATSON, D D. S , SMITHFIELD, PA.

I send you a sample plate, from which the illustration is made, which is a new and useful form for the support of artificial teeth.



It consists simply of a rim fitted over the gum of the alveolar ridge or border, with a series of ridges and air-cells. In my practice it has given entire setisfaction to the patients for whom I have made them in the fifty cases, or more, in which I have used them.

My claims are:

First. That it does not produce gagging or nausea.

Secondly. It never strikes or touches the hard palate, which frequently causes the plate to rock or tilt, and sometimes to drop while eating or speaking.

Thirdly. It never makes the mouth sore, and patients find that they taste their food better with these plates than when the whole palatine arch is covered.

Fourthly. It is adapted as well to flat as to high or deep arches or spongy gums. Enunciation, Articulation and Deglutition are improved on account of the stability with which the plates are held next the gums by the arrangements of the cells and ridges made in the plates.

PRACTICAL PLACE.

The Effects of Amalgam Fillings.

I had a patient that came to me ten or twelve years ago, with teeth that I could not fill with gold. I filled with amalgam, and stated that it might last three years, but how long was uncertain; these teeth are doing good service to-day, and I do not see why they should not last ten years more. I freely admit that I could not have done it with gold, but others might have done it.—*Dr. C. S. Butler, Buffalo.*

To preserve your instruments from rusting, immerse them in a solution of carbonate of potash for a few minutes, and they will not rust for years, not even when exposed to a damp atmosphere.—*Columbus Medical Journal.*

Duplicating Composition.

In reply to "York," I have had no experience with any material sold for this purpose, but have used the following with perfect success in complicated mouldings with deep undercuttings.

Soak one pound of amber gelatine, such as can be bought from any grocer, in cold water for five or six hours; drain all the water away, melt the gelatine at a low temperature, and when perfectly melted, add five pounds of commercial glycerine. This mixture, from repeated melting, becomes thick, but can be restored to its original state by the addition of a little water when melting.

Before pouring the composition, the surface of the model should be varnished, and after the varnish is dry, the surface must be covered with a thin film of oil to prevent adhesion. If the composition referred to by "York" is similar to the above, it can be made thin by the addition of a small quantity of water; if it is sticky and brittle, this is caused by an excess of glycerine, which can be remedied by the addition of a small quantity of soaked gelatine. It is important that the gelatine shall be perfectly melted before the glycerine is added; if mixed cold there is great difficulty in obtaining a perfect combination.

The composition is permanent, does not spoil with keeping, and can be used constantly for years without deterioration if the water lost by evaporation is replaced.

A cheaper compound with similar properties can be made with soaked glue and treacle, but this is much more liable to tearing apart, and varies greatly in hardness in cold or hot weather.—*Thomas Fletcher, Warrington.*

Aborting Abscesses.

Apply an yeast poultice to the affected parts, upon which equal parts of borate of soda, boric acid, salicylic acid and powdered tannin should be dusted.

A moderate dose of calomel should be given internally. This treatment is usually sufficient to abort an abscess if it is resorted to when the local symptoms first make their appearance.

Frictions with the following ointment will also be found valuable:

℞. Salicylate of bismuth................ $2\frac{1}{2}$ drachms.
Lanoline.............. .... $7\frac{1}{2}$ drachms.

—*Le Bulletin Med.*, September 29, 1889.

Preserving Qualities of Copper Amalgam.

I have, within a day or two, examined a mouth where the teeth were of such poor organization that it would discourage any of you, should it come under your professional care. We have tried almost everything; gold, cements, alloys of different makers, gutta-percha, and all were failures; sometimes in less than six months, except the front incisors and cuspids, which were preserved by gold, some fillings as long as seven years; but the molars and bicuspids resisted every effort, and I was contemplating capping them with gold caps or crowns, when I thought, now, I will give copper amalgam a trial: and, after about twenty-eight months, I find the margins all perfect and the teeth doing well. Within the same time I have inserted a number of other alloy (silver, tin, etc.) fillings, and they have all gone to pieces; and I have now removed them and filled with the "old reliable" copper amalgam. Perhaps you will say, "Why did you fill with other amalgams during this period if you found that the teeth were being saved by the copper amalgam?" Just the reason why many of you have refrained from its use, viz., because my faithful servant was black. In fact, I stumbled on the "color line," like some of my Southern friends.—*Dr. Osmun, in Archives.*

Legal Status of the title D. D. S.

There has been considerable discussion the past summer as to the legal status of the title of D. D. S. A few years since I was drawn as a juror, and I claimed exemption as a surgeon. Judge McArthur refused to accept it. I employed a good lawyer and appealed from his decision. It was carried to the court in general term and I was sustained, and no name of a regular graduate of a dental college has

since been placed in the jury box. I put in evidence the case of Wm. H. Seward, while Secretary of State. On the night of the assassination of Abraham Lincoln he was attacked by a would-be assassin and had his jaw severely injured. The Surgeon-General of the United States sent for Dr. Gunning, of New York, and placed Mr. Seward under his care, who successfully treated the case. Dr. Gunning was not an M. D , but a graduate of the Baltimore College of Dental Surgery.

The title of D. D. S. is equal, in a legal sense, to M. D. as an oral surgeon, and very justly so if he has been properly taught in a reputable dental college, and I am glad to see our Chicago brethren have been converted to this doctrine.—*H. B. Noble*, *Washington*, *D. C.*

ADAPTING BLOCK TEETH ARTISTICALLY TO THE MOUTH.—I will, if desired, show a new process of adapting the block teeth artistically to the mouth with very little expense and trouble. When I have a peculiarly shaped mouth to treat and have not blocks to meet the demands, I break up the blocks in sections. I take a block of three and break in two and just shape them on the cast as you would a single tooth—that is the ordinary gum enamel—and unite them with gum body and bake them in the furnace. You may use any kind of a furnace. I take a strip of platinum that is nearly square and as thick one way as the other, and cut some notches for my teeth and band it over my pins back of the block and solder them with pure gold. I bake them in the furnace and transfer them to the plaster block and dress them the same for rubber.—*Dr. Comstock.*

FOR DESTROYING PULPS OF TEETH.—The *Dental Review* gives the following formulæ.

℞ Arsenic Acid..gr. xc.
Hydrochlorate Cocaine ....gr. x.
Iodoform ....gr. vii.
Oil of cloves add q. s. to form a stiff paste.

℞ Acidi Arseniosi..gr. xc.
Cocainæ Hydrochlor ....gr. x.
Iodoformi...gr. v.
Ol. Cassia q. s. to form a stiff paste.

Apply $\frac{1}{60}$ gr. to the pulp, and allow it to remain 48 hours. Always seal the cavity with gutta percha. When the dressing is removed, keep the cavity dry. Wash it with dialysed iron, puncture the pulp and apply alcoholic sol. of tannin. Seal the cavity for eight days,

when the pulp may be removed painlessly. The root may be filled at once, if nothing has been allowed to get in the cavity during this time.

For use in a Sensitive Tooth.

℞ Hydrochlorate Cocaine........................ gr. x.
Melted Carbolic Acid ....gr. xc.

M. Sig.—Use in a sensitive tooth, previously drying the cavity and heating the liquid.

Lubricator.—Oil of mustard is now being praised as a lubricator for machinery. The lubricating value is said to stand to that of olive oil in the proportion 263 to 168. It remains fluid at 7° or 8° C. below freezing point, and reduces to a minimum heat due to friction.—*L'Odontologie.*

Some Suggestions.

Wrapping fibers of cotton or floss silk on a fine smooth round nerve probe may be easily done if the end of the probe is first inserted, a time or two, into a piece of beeswax.

Where the gum persists in bleeding into a cavity, while filling without the rubber dam, tie a coarse thread waxed around the tooth, forcing it well toward the root.

If it is desirable to leave a vent hole for escape of gas from a "dead" tooth, insert the end of a thoroughly waxed linen thread into each root canal, and fill with amalgam around the thread, so that it will not be in contact with the tooth at any place except well up into the root, and when the filling is completed draw out the thread. In a cavity including the side of the tooth, draw the thread from as near the gum as possible to prevent food being forced into the opening.

A convenient engine bit holder may be made of a square or oblong block of wood, about an inch and a quarter thick, and as long and wide as may suit the fancy (or supply of engine burs,) with rows of holes for burs about one-fourth of an inch apart. Place the burs, beginning with the smallest, at the end of a row, and grade them up to the largest of the shape, then follow with another shaped bur in the same order, placing all the sizes of the same shape in one group. It is better than a circular or cone-shaped one, because the different burs are more readily located when wanted, and may be placed in a drawer when not in use.

To preserve the packing in your vulcanizer, always put a small

quantity of water in it as soon as the flask is removed after vulcanizing, and close it tightly, leaving it closed till needed again.

Sometimes it may be of advantage to cut the air-chamber pattern in two from front to rear, and place one piece on either side of the cast, leaving one-eighth of an inch or more space between the pieces.

Detection of Fœcal Matters in Water.

As a test for local impurities in potable water (where they occur more frequently than is generally supposed) Griess recommends paradiazobenzol-sulphuric acid in a feebly alkaline 1 per cent. solution. When this is added to pure water, the latter remains colorless; but should the water become yellow within five minutes, the presence of organic human or animal excreta is denoted. One part of normal urine in 5,000 can be detected in this way, and one of horse's urine in 50,000.

Hygienic Tooth Powder.

Polasek (Prague *Rundschau*) recommends the following as answering all requirements: Carbonate of lime, precipitated, 1,500 grs.; carbonate of magnesium, 50 grs.; almond soap powder, 300 grs.; orris root powder, 150 grs.; thymol, dissolved in alcohol, 2 grs.; oil of peppermint, 100 drops; oil of cloves, lemon and eucalyptus, of each 50 drops.

Tannin in the Treatment of Burns.

A correspondent of the *Pharmaceutische Zeitung*, speaking from his own experience, says that tannin cannot be too highly recommended as an application to burns, especially when very extensive, the skin being entirely removed. A 5 per cent. solution is squeezed from a sponge over the denuded surface, which is then dressed with some soft ointment, either with or without tannin. Pain immediately abates, and the healing process is wonderfully rapid. The tannin solution must, of course, be freshly applied as often as the dressings are removed.—*Drug Circular.*

Warts—Their Cure and Removal.

In reading the *Scientific American* of February 8, I found a remedy for removing warts. I send you a remedy that we have found to be better and more simple. Take common washing soda and make a very strong solution. Apply it to the wart four or five times a day.

We have tried this and have never seen one wart that this would not remove in a few days and leave no soreness at all.

A. J. Mosley & Sons.

West Philadelphia, Pa.

Some one has discovered that a weak galvanic current, which will sometimes cure a toothache, may be generated by placing a silver coin on one side of the gum and a piece of zinc on the other. Rinsing the mouth with acidulated water is said to increase the effect.—*Weekly Med. Review.*

Cocaine Pencils for Use on the Skin.

A writer in the *British Medical Journal* makes a suggestion which is easily convertible into a capital article for a cosmetic "special." It is, in short, a pencil or "stick" for use on the chafed and irritated skin, or on skins very susceptible to insect bites, etc. He says that an addition of two per cent. of cocaine to the ordinary cacoa butter pencils converts the latter into a cosmetic remedy, which gives almost instant relief when rubbed over the irritated spot.

A woman who knows it to be a fact says, some men will get up out of bed at night in the coldest of winter weather to go to a fire, who cannot be induced to get up at 7 o'clock to start one in the kitchen stove.

How to Take a Wax Impression.

Heat the wax until it has about the consistency of dough, then proceed in the usual way to make the impression, pressing the wax moderately against the ridge. Remove carefully, and with a hot knife cut away the surplus wax, cool slowly, and when quite hard replace in the mouth, holding it solidly to place with the fingers, at the same time pressing hard and thoroughly against the labial and buccal aspects of the ridge with the thumbs until the gurgling of saliva ceases. Now, if the impression feels tight to the patient it should be carefully removed, but should it fail to adhere tightly it should be pressed more heroically until it will remain in position without ulterior support. A re-insertion of the impression in the manner described after it has cooled, produces an astonishing successful result. This method applies especially to full cases, ninety per cent. of which can be successfully worked. It is simple; try it.—*Dr. A. N. Coates.*

To Detect Incipient Putrefaction.

Litmus-paper, which must be very sensitive, may be employed for this purpose (*Deutsche med. Zeit.*). Meat, sausages, etc., when fresh, will show a decidedly acid reaction, which changes under the influence of the putrefactive bacteria, to a feebly alkaline one.

Hydrogen Peroxide for Insect Bites.

Dr. Phillippe Ricord, of Newark, N. J., writes to the New York *Medical Record* that while charging his atomizer with peroxide of hydrogen solution, at the bedside of a child suffering with diphtheria, his attention was attracted by the patient's mother, who appeared in pain and stated that, while taking up a blanket to wrap about her child, she supposed she had been pricked by a needle, and, on further examination, discovered a hornet between the folds she had touched. Thereupon he immediately directed the peroxide of hydrogen spray into the wound, the surrounding tissues in the few seconds that elapsed being swollen to such an extent as to distinctly mark its site. Instantly all pain ceased, and the swelling rapidly disappeared. In this case the wound was still sufficiently open to readily admit the peroxide of hydrogen, and the destruction of the virus was apparently in a moment so completely accomplished that no further treatment was afterward required.

How to Detect Impure Water.

Fill a perfectly clean quart bottle half full of water, cork and shake it; remove the cork and see if any odor can be detected at the mouth of the bottle. Cork the bottle again and put into a warm place for a few hours, or set into a pan of hot water for an hour. Shake, uncork, and again test by smell. If an unpleasant or faint musty odor is perceptible, the water requires more minute investigation. The second simple test is to evaporate a quart of water to dryness in a new tin pan or cup and note the character of the residue and what happens when it is strongly heated in a metal spoon. If the sediment left after evaporation is small, and on being burnt in a metal spoon gives rise only to such an odor as comes from burning vegetable matter, the water is not greatly contaminated with sewage. But if the sediment is in considerable quantity, dark in color, and burns, giving off the peculiar odor of burning hair or other animal matters, then the water is foul.—*Invention.*

Treatment of Root Canals.

Having removed whatever more solid remnants there may be, I

wrap a few fibers of cotton or silk around a broach and then repeatedly wipe or mop out the canal with a strong solution of ammonia, which aids in the desiccation of the septic contents of the canal and tubuli. It must be remembered that the septic matter is not only in the root-canal, but in the dentinal tubes. To remove it from or destroy it in these tubuli it must be reached by imbibition of fluids which will change its character so it can be more readily washed out or subsequently affected by the germicides used. Carbonate of sodium packed into the pulp-chamber and root canals and left for a day, well sealed in, will also accomplish this object. Indeed, I believe it to be one of the very best applications at this stage of the treatment, and I have the best success from it. It saponifies and renders soluble the septic contents so that the canals may be readily washed out with hot water and made ready for the dressing with a germicide. —*Dr. A. Retter*, *Cosmos.*

If you would live to old age in the enjoyment of all your faculties, and the consciousness of a virtuous and well-spent life, with garlands of peace and joy in waiting for you beyond the present, use no amalgam but Lawrence's—"the Old Reliable"—and never purchase that made "according" to a humbugging analysis when you can obtain the genuine article at the Macon, or any other first-class Dental Depot.—*A. L.*

Very Large Fees.

According to newspaper reports, the doctors who attended the late King of Portugal during the last few weeks of his illness, presented bills for their services amounting to nearly $100,000. One of them demanded $14,000 for ten visits, another demanded $17,000 for fifteen, while a third thought that $30,000 was not too much to ask for his attendance at eighteen consultations. Eventually the new king succeeded in effecting a settlement of their claims by means of a lump sum of $60,000.

Carbolic Acid For Toothache.

The *Progres Medical* credits Guild with a method of treating carious toothache by means of a mixture of equal parts of crystallized carbolic acid and flexible collodion, which is to be carried to the bottom of the cavity. The pain is said to disappear instantaneously. A perhaps safer plan would be to touch the cavity with the acid, and then carefully rinse the mouth.

Ammonia as an Antiseptic.

Dr. Gottbrecht has recently repeated a series of experiments made some time since by Dr. B. W. Richardson as to the antiseptic power of ammonia, and his results (*Arch. exp. Path. u. Pharm.*) confirm the statements made by Dr. Richardson as to the value of this agent. He found that animal matter preserved in a five per cent. solution of ammonia was free from putresence at the end of two years. while meat kept in an atmosphere impregnated with ammonium carbonate was nearly unaltered at the expiration of six months.

Dr. E. M. Todd, in the *Dental Record*, gives the following as a local anæsthetic, which he has tried and found very efficient:

℞. Cocaine Mur., gr. 50.
Acid Boracic, gr. ii.
Liq. Hyd. Bichlor, M. 40.
Aquæ Destal ad. M. 250.

M. To be applied locally by means of pledgets of cotton, held tightly to the gum on each side of the tooth to be extracted.

Campho-Phenique.—"I consider campho-phenique indispensable medicine in my case of remedies. I use it for local anæsthesia in sensitive cavities with as much success as any other local anæsthetic; as a dressing to all prepared cavities before filling; in all root canals after the removal of pulp and nerve, as a dressing in all pockets about the teeth after the removal of calcareous deposits. In fact, it is no longer so much a question with me, where to use it, as, where not to use it.

"Some dentist asked me not long since what antiseptics and germacides I used. I said: First I use champho-phenique; then secondly, I use campho-phenique; and in the third place, I use camphe-phenique. If I must be confined to one preparation, I would select campho-phenique."—*Dr. I. D. Pearce.*

Rossen's Method of Treating Corns, warts, and other epider-excrescence, is as follows: Moisten the excrescence with a solution of boracic or salicylic acid, and cover it with a layer of from 4 to 5 millimeters (one-fifth to one-quarter inch) with pure crystallized salicylic acid. Apply on top of this a bit of borated lint of four thicknesses, and finally envelop the dressing with a piece of rubber adhesive plaster. Unless the excrescence is a very large one, five

days will suffice to detach the corn completely, leaving the skin beneath it without a trace of cauterization. For very large growth a little longer time is necessary. Of course, the dressing must be left *in situ* during the time.—*Nat. Drug.*

USEFUL PLATE FOR HOLDING ODD PIN PLATE TEETH.—Cut a piece of linoleum floorcloth into three or four inches square. Before inserting the teeth slightly beat the linoleum and the pins will go in easily. I have found this method of fixing odd plate teeth much superior to wax or gutta-percha, and is more durable and cleanly. New teeth can be inserted in the place of those used. The very thickest cloth must be used, as the length of pin makes this necessary.

KEEP BUSY.

The secret of success in life is to keep busy, to be persevering, patient, and untiring in the pursuit or calling you are following. The busy ones may now and then make mistakes, but it is better to risk these than to be idle and inactive. Keep doing, whether it be at work or seeking recreation. Motion is life, and the busiest are the happiest. Cheerful, active labor is a blessing. An old philosopher says: "The firefly only shines when on the wing; so it is with the mind; when once we rest, we darken."—*Elmina.*

FOR STRENGTHENING GOLD CROWNS MADE FROM THIN MATERIAL.

Dr. Geo. Evans uses prepared filings made from a thick piece of solder grasped in a vise, with a clean flat-plate file. The filings are allowed to fall into a box or upon a sheet of paper, and a magnet is passed through them to remove any minute particles of steel detached from the file. To five parts of the filings is added one part of Parr's prepared flux or of finely vitrified borax. Solder prepared in this way is not only useful for strengthening crowns, but in fine soldering work of all descriptions it is much to be preferred to solder cut in small pieces, as the fine particles separately take up the heat and fuse more easily. The flow of the solder is also under better control.

The prepared filings are carried in a dry state with a spoon shaped excavator, and packed in position in the cusps or placed on any desired spot. The crown is then held in the flame of an alcohol lamp and slowly heated to a cherry red, which is sufficient to fuse the filings, which will melt down exactly where they have been placed. During the process the crown should be grasped on one side, at the extreme edge of the collar, between the points of small tweezers, and

held in such position as to present a full view of the inside. The melting of the solder is thus instantly seen, when the crown should be quickly removed from the flame. If it is desired to strengthen the sides of the crown also, the surface of the interior is first dampened with a piece of cotton moistened with water on the end of an instrument, and a quantity of solder filings placed in the crown and shaken around against the sides. A portion will adhere evenly all over the damp surface, and the surplus is then dropped out, the quantity required placed in position, and heat applied as described, when the solder will be fused evenly over the surface of the gold without melting the sides or materially changing the general form of the interior of the crown.—*Ohio Journal Dental Science.*

To Abort a Boil.

A writer in the *Wien. Med. Wochenschr.* states that a boil may be aborted by simply scraping the skin over the threatened seat of invasion with a scalpel until a drop or two of blood exudes on pressure.—*College and Clinical Record. October, 1889.*

How and When to Drink Water.

According to Dr. Leuf, when water is taken into the full or partly full stomach, it does not mingle with the food, as we are taught, but passes along quickly between the food and lesser curvative toward the pylorus, through which it passes into the intestines. The secretion of mucus by the lining membrane is constant, and during the night a considerable amount accumulates in the stomach; some of its liquid portion is absorbed, and that which remains is thick and tenacious. If food is taken into the stomach when in this condition it becomes coated with this mucus, and the secretion of the gastric juice and its action are delayed. These facts show the value of a goblet of water before breakfast. This washes out the tenacious mucus, and stimulates the gastric glands to secretion. In old and feeble persons water should not be taken cold, but it may be with great advantage taken warm or hot. This removal of the accumulated mucus from the stomach is probably one of the reasons why taking soup at the beginning of a meal has been found so beneficial.

A Simple Storage Battery.

Get two half round porous cups and a round glass jar large enough for the two porous cups to stand in upright. Get two plates of sheet lead one-sixteenth of an inch thick, wide enough to fit the half-round

side of the porous cups and deep enough to come an inch or so above the top edge of the cups and jar. Solder a stout copper wire or a screw post to each lead plate at the top. Place the lead plates in the cups and fill the cups nearly full with a paste made of red lead mixed with a solution of sulphate of soda thin enough to run like a cement. The glass jar containing the two cups should be filled to within half an inch of top of cups with sulphuric acid and water, about one part of acid to eight parts of water. One plate should be marked X, so that, in charging, the currents will be correctly connected. This may be charged by attaching to a series of a dozen sulphate of copper cells for twenty-four hours, or from a dynamo. It should always be charged in same direction, and it will improve by repeated chargings. A wooden cover may be fitted to the glass jar, and evaporation of the fluid should be replenished by adding water. Two or more cells of this battery will work small motors, lamps, and induction coils, and if thoroughly charged will retain a large volume of electricity for considerable time. After once being well charged, four to six cells of sulphate of copper battery will recharge it—*Journal of the Telegragh.*

Statistics of Breathing.

In each respiration an adult inhales one pint of air.

A man respires sixteen to twenty times a minute, or twenty thousand times a day; a child twenty-five to thirty five times a minute.

While standing, the adult respiration is twenty-two; while lying, thirteen.

The superficial surface of the lungs, *i. e.*, of their alveolar space, is two hundred square yards.

The amount of inspired air in twenty-four hours is ten thousand litres (about ten thousand quarts).

The amount of oxygen absorbed in twenty-four hours is five hundred litres (744 grammes); and the amount of carbonic acid gas expired in the same time, four hundred litres (911.5 grammes).

Two-thirds of the oxygen absorbed in twenty-four hours is absorbed during the night hours from 6 p. m. to 6 a. m.

Three-fifths of the total carbonic acid is thrown off in the day time.

The pulmonary surface gives off one hundred and fifty grammes of water daily in the state of vapor.

An adult must have at least three hundred and sixty litres of air an hour.

The heart sends through the lungs eight hundred litres of blood hourly, and twenty thousand litres, or five thousand gallons, daily.

The duration of inspiration is five-twelfths, of expiration, seven-twelfths, of the whole respiratory act, but during sleep inspiration occupies ten-twelfths of the respiratory period.—*Annals of Hygiene.*

MODELLING COMPOSITION FOR TAKING IMPRESSIONS.

BY DR. GEO. S. STAPLES, SHERMAN, TEXAS.

(WITH EDITORIAL REMARKS.)

Having noticed several articles recently in regard to taking impressions with modelling composition, I wish to give a few ideas; my own experience of about eight years with it.

We all know plaster to be the favorite material with most dentists for taking impressions; and I believe the reason why they prefer plaster is that they have never thoroughly tried modelling compound, and especially for partial plates. We hear men say they cannot get perfect impressions for partial sets with anything but plaster, because plastic materials are drawn out of form by the teeth when removing the impression from the mouth. Suppose the impression is taken in plaster, and by gathering up the pieces and fitting them in place you get a perfect impression of the parts; then, suppose you make a plate to perfectly fit that model: can you get that plate in the mouth without trimming it? No; neither will it fit better when you do get it in, than if you had taken the impression in wax at first, and slightly trimmed the model where the wax had dragged, for the points that do the dragging will prevent any plate from going into the mouth, that is made from a perfect impression; hence, I have always considered the great stress laid on the securing of a perfect impression for partial sets of teeth, by the "all plaster cranks," as one of the biggest pieces of "tomfoolery" ever advanced by the profession; and yet I do not remember of ever having seen an article published, denying superiority of plaster over everything else.

I will make some broad assertions, all of which I am ready to defend whenever contradicted.

My first assertion is that modelling compound is better than plaster for all kinds of impressions, because: first, it is less disagreeable to the patient; in the next place, for full sets, I can get as accurate an impression as can be made with plaster, a much smoother model than can possibly be made from plaster, in much less time, with less trouble; and for partial sets, I can construct a plate from the model taken from the compound impression, that will fit as accurately when placed in the mouth, as can be made from an impression taken with any other material

Why subject yourself and your patient to the inconvenience and

trouble of the plaster, when the compound will answer every purpose better? I will give my method of using it, and ask all who have not done so, to try it as I have done, and report results:

There are several grades of the compound; keep about two, and by mixing use it just as stiff as can be introduced in the mouth, without burning. Use impression cup larger than for plaster, and a superabundance of the compound; press it up slowly, and keep the lips and soft parts out of the way, until it is thoroughly adjusted all around; previous to inserting, put a Horton's rubber bib on; use ice-water with the syringe until perfectly hard, before removing. I believe we can secure a better impression in this way than can be taken with any other material now in use.—*Archives of Dentistry.*

The above article, by Dr. George S. Staples, of Sherman, Texas, is rather broad in its assertions, when he says: "I have always considered the great stress laid on the securing of a perfect impression for partial sets of teeth by the 'all-plaster cranks,' as one of the biggest pieces of 'tomfoolery' ever advanced by the profession: and yet I do not remember (of?) ever having seen an article published denying the superiority of plaster over everything else."

Neither have we. In all discussions or articles on the relative merits of different materials for taking impressions of the mouth, the palm has been accorded to Plaster of Paris, and especially has this been the verdict for *partial impressions*, so that it has become an axiom, which cannot be refuted, that the more difficult it is to take an impression (for a partial denture especially) the greater the reason to take such an impression with Plaster of Paris.

It is not merely that the impression should be perfect on the gum surface where the plate is to rest, but it is the *certainty* that this surface is perfect; and how can this be, when the material which Dr. Staples asserts "is better than plaster for all kinds of impressions" is so easily bent or twisted out of shape in its withdrawal from the mouth?

We had to make a partial case over for a lady, where the impression was taken with modeling compound, which the lady *never could wear.* As far as the workmanship was concerned, there was nothing to criticise—except favorably—in the plate; but the trouble was that the *plate did not fit*, and it did not fit because the impression must have been bent or twisted in its withdrawal from the mouth. Can Dr. Staples or any one prevent this? Perhaps he or *other modeling compound cranks would foist this, one of the biggest pieces of tomfoolery ever advanced, on the profession.*—Ed.

DOCTORS' CHARGES.*

A correspondent in a contemporary expresses dissatisfaction with the present system under which medical men are paid, believing it offers temptation to them to keep patients ailing, instead of trying to effect cures. The temptation may exist, and is, no doubt, succumbed to by the unprincipled, but the number of princely fortunes now made by medical men is no larger than in former times, and when they do occur it is not so much attributable to the system of charging, as to the extraordinary skill or luck of the practitioner. A few illustrations will let light on the subject.

Eccentricity, or fear of dying, on the part of patients, has been the making of the fortunes of many physicians and surgeons.

A certain wealthy major, of the name of Snodgrass, is said to have never offered his surgeon less than five guineas a visit, and fifty guineas for any operation, though it were but the extraction of a splint under the finger-nail.

A case is recorded by Monsieur Latour of a patient who had such a fear of dying that he instructed a physician to visit him every morning at nine o'clock, in bed, and paid him forty francs for each visit. With the approach of age his fears increased, and the visits eventually rose to four a day, for each of which forty francs were paid. The lucky doctor in this case made 14,600 francs a year out of his patient.

Lord Dudley and Ward was in the habit of paying his medical attendant with whatever he happened to have in his pocket. Sometimes the reward took the form of a well-filled purse; at others of a trifling article worth only a few coppers.

Dr. Yates, of Brighton, was presented by a grateful patient with a carriage and horses, and £500 a year to keep them, and Baron Hourtaloup, another eminent surgeon, received 400 guineas for an operation on a patient who had suffered agony from a distressing complaint which necessitated it.

Of instances of large incomes made without the assistance of reckless liberality on the part of patients, but wholly through the medium of exceptional skill, there are very many.

In the year which preceded his leaving Broad street, Sir Astley Cooper received fees amounting to £21,000, and his annual income for many years afterwards was £15,000. Sir Astley was no niggard. and is said to have spent £20,000 in his attempt to get his brother into Parliament.

* From the London *Monthly Magazine of Pharmacy.*

Dr. Chambers and Sir Benjamin Brodie are each credited with having made £12,000 a year, and Dr. Lettson, who practiced long before them, and lived in Chamberwell Grove, London, made the same income. During a five months' stay at Tortola, in the West Indies, he made £13 a day.

Sir Everard Home once returned his income as £21,000 a year to the income-tax assessors, but this is thought to have been an exaggeration, as his celebrated uncle, Mr. Hunter, who far surpassed him in skill, did not make half that sum.

Soon after the discovery of the use to which chloroform can be put, Dr. Snow made £1,000 a year simply for administering the drug in private practice.

Dr. Mead, who attended Queen Anne, made £7,000 in one year; the physicians who attended Queen Caroline received 500 guineas a year, and the surgeons 300 guineas each; for attending George III, Dr. Willis got £1,500 a year for twenty years, in addition to a gift of £650; and the surgical and medical staff of our present Royal household costs considerable over £4,000 a year, of which the best paid member, the surgeon-apothecary, gets £1,000.

All these examples go to show that where excessive incomes are made, the cause is not solely the system of charging adopted. If more examples are needed, we may turn to the quack doctors, and find James Morrison amassing a fortune of £500,000 out of his pills, which were chiefly made of oatmeal and aloes; while Mrs. Mapp, the "bone-setter," netted 20 guineas a day by her practice.

Still, as we have said, it sometimes occurs that a bill may be run up to larger proportions under the present system than seems needful. A case in point was the subject of a trial in the Queen's Bench Division some time ago. A medical man claimed from a Welsh railway company the sum of £174 5s. for attending a lady and gentleman who had been injured in a collision. The gentleman was attended for seventeen weeks, nine of which he was in bed, and he was charged for 755 doses of medicine, 73 lotions and outward applications, and 100 pills and powders; while the lady was credited with 222 doses, 9 powders, and 74 lotions. Whether the operation of these doses, powders and lotions were sure or not, it certainly must have been slow. It is not necessary that they should have contained many ingredients, for Sir Lucas Pepys, formerly President of the Royal College of Physicians, used to say that he never drew upon more than a dozen articles in all his multitudinous preparations. The judge in the above case clearly thought the medical man had overdone it, as he gave judgment for £100 only.

But, after all, it is hardly to be expected that many doctors will follow the example of the great Sir Henry Holland, who declared his income should never exceed £5,000 a year. Human nature prompts to the filling of the coffer in all trades and professions. Patients who have little money to spend might find wisdom in the Italian epitaph: "I was well—wished to be better—read medical books—took medicine—and died."

ARRANGEMENT OF TEETH.

By Prof. L. P. Haskell, Chicago.

The *Cosmos* for August contains an admirable article, entitled "Typical Tooth Forms," which is worthy the study of every dentist. I wish to call attention especially to the diagram marked "S," page 614, and the description on the previous page, a careful study of which will be a great aid in the proper arrangement of teeth.

It states that the tips of the six anterior teeth (in nature) form the arc of a circle, the centre of which is the width of the central, lateral and cuspid teeth.

A line at right angles to the median line, through this centre, will pass through the centres of the second bicuspids.

A second line, parallel to this, through the posterior periphery of the circle, will pass through the posterior edges of the second molars.

The teeth in the arch posterior to the cuspids are almost directly in a straight line toward the centre of the condyles, being deflected slightly inward at the anterior cusp of the first molar.

In the lower jaw, the four incisors are more nearly in a straight line than the upper incisor, and the direction changes sharply at the cuspid, and then forms a gentle curve along the buccal faces of the teeth.

I would suggest the dentist have a series of tin circle with handles from posterior edge. Select one for the case in hand by the width of teeth to be used, remembering, however, that the so common use of *small teeth* where they do not belong, would result, under this rule, of very much circumscribing the room for the tongue. I am not sure but it would be the means of teaching some dentists a lesson on this point.

To secure the proper arch to the grinding surface, a simple rule suggested to me by an old practitioner I have found serviceable, as follows:

Arrange the *ten* anterior teeth so that they will be on a line when

placed on a flat surfece, and the molars dipping upward on an inclined plane.

Arrange the lower teeth so that when placed on a flat surface only the incisors and seeond molars touch.

"Circumstances alter cases," so there can be no inflexible rule for the arrangement of teeth, and the dentist must use his judgment. As for instance, in very pointed jaws, especially where the lower teeth remain, and form a V-shaped arch, the upper teeth should be so arranged that the centrals are the most prominent, the laterals inside the circle, and the cuspids still further inside. This is a very common form of natural arrangement.

I would further suggest that the *teeth manufacturers* might study the article referred to with good advantage, especially in the formation of bicuspids and molars. If they follow these typical tooth forms, we should be rid of the numerous imitations of anything but natural teeth, I refer particularly to *plain* teeth, *thin*, *narrow*, too long often by one-third, with the lingual cusps of upper, as well as lower, longer than the buccal cusps.

HINTS ON USING THE RUBBER DAM.

As almost every operator has views and customs peculiar to himself, this subject could call forth a diversity of methods, all of which, though not differing so much in the main, would possess individual hints of valuabe importance. I shall not endeavor to treat it by class or rotation, but merely advance a few hints regarding the application of the dam. The first point to be observed in applying the dam, is the position of the teeth and their relation to each other; this is essential from the fact that the points for punching, and the nice adjustment of the dam depend upon these conditions. The necessity for observing this rule is obvious, as misplaced holes will almost invariably set the dam askew and create many folds, which exclude the light and greatly impede deft manipulation, and which are difficult to control, even with the aid of an assistant. There is now on the market a guide punch, with eyes corresponding to each tooth, yet, as the teeth are not always regular, it has no special advantage over other styles; the Ainsworth, perhaps, being most popular. The dam being properly punched, the spaces between the teeth should be examined; if they will permit the passage of a ligature, little trouble need be had; if not, space should be gained, for the dam will not pass where a ligature has failed. It is not infrequent that some difficulty is experienced in retaining the dam until a clamp or ligature may be

applied, and especially is this the case with molars and ill-shaped teeth; those who have assistants always at hand can readily overcome this vexatious problem, yet it often becomes necessary to accomplish this operation without such aid. If the tooth, or teeth, to be exposed be too far back to allow retention of the dam with the thumb and fore-finger until a clamp is placed, the rubber may be slipped over the clamp and both adjusted at once, or a pin may be used, after the method suggested by Dr. Herbst, as follows: Take an ordinary pin and cut it off, leaving sufficient length to pass the inter-space at the gum margin, with a slight projection on each side; this is inserted first, when the dam is hooked over it, thus a retention is gained until a clamp or ligature can be adjusted. In case the space is too great to retain the pin, a ligature and bead may be resorted to: pass the ligature through the bead and tie it about the tooth, leaving the bead on the lingual or palatal surface, the knot serving the same purpose on the labial side, pass the dam over and with the aid of a thin, curved burnisher, press it under the ligature; this, in many cases is a happy recourse. In those cases of marginal decay, so often met with, the difficulty may be overcome by using a ligature of fine binding wire; the wire must be annealed and twisted snugly about the tooth with a pair of small, flat-nosed pliers, leaving the extension on the labial surface; with a gentle pressure, the dam is carried above the cavity; if the ligature is inclined to slip, a gentle pressure with the finger will retain it. The credit of this device belongs, I believe, to Dr. G. S. Staples. Numerous clamps, and also Dr. Bowman's gum depressors, are designed for this purpose, but where ligatures can be used they are more desirable and less cumbersome.

In regard to preparing the dam, six by eight inches is a convenient size; this measurement being sufficient to meet most requirements. When the dam has been applied, a napkin should be placed under it and retained, either by pins or by the clamps attached to the holder. The napkin should be removed as often as it becomes moist, as this relieves the patient of much discomfort and avoids an overflow of saliva, which is objectionable indeed. Aside from the holder, weights are of great assistance in controlling the free ends of the rubber.

In conclusion, I believe that most beginners look upon the application of the dam as a difficult operation, and are inclined to accomplish all possible work without its use. If they will be persistent in their endeavors, they will perceive that in no other branch of the operator's work does a little experience develop as much dexterity, and that those features which appear most difficult are quite readily mastered.—*Warwick Winston, Montana Archives.*

The 22d Annual meeting of the Georgia State Dental Society, will be held at Gainesville, Ga., July 9th, 1890. All delegates to the Southern Dental Association are cordially invited to meet with us.—L. D. Carpenter, Cor. Sect'y, Atlanta, Ga., May 15th, 1890.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held on Tuesday, April 1, 1890, the following officers were elected for the ensuing year: President, C. N. Johnson; First Vice-President, C. H. Thayer; Second Vice-President, I. A. Freeman; Secretary, A. E. Baldwin; Corresponding Secretary, T. L. Gilmer; Treasurer, E. D. Swain; Librarian, A. W. Harlan; Geo. H. Cushing to succeed himself on the Executive Committee; C. F. Hartt, E. A. Royce and S. B. Palmer, Board of Censors.—T. L. Gilmer, Corresponding Secretary.

PLATINA.

Speaking of the recent marked advance in the price of platina, the "British Journal of Photography" says: "The unfortunate part in the rise in the price of platinotype material is that there is no immediate prospect of its being again reduced. The supply of platina is extremely limited, and, owing to its inoxidisability, it is now being applied to many new purposes, one of which, amongst others, is the coating of the insides of steam boilers; hence the existing supply of the metal is not proving equal to the demand. Added to this, the whole of the platina business is in the hands of a few individuals; therefore the trade may become, if it has not already done so, more or less a monopoly."

TO AID THE CENSUS OF 1890.

Any one interested in the sick-benefit, funeral-aid and death-beneficiary associations of the United States, can help make the statistics of their organizations for the forthcoming census more complete and disseminate the knowledge of the good work they are doing by sending the names of such societies as they may know of, and the addresses of their principal officers, to Mr. Charles A. Jenney, Special Agent of the Eleventh Census, 58 William street, New York City.

THE

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OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S.

(Continued from page 108.)

The filling of the proximate surfaces of the other incisors will be conducted in a similar manner as the case we have exemplified. If, however, the decay has consumed the tooth towards its labial aspect, the approach to the cavity will have to be made from the front, as shown in Fig. 60, instead of as shown in Fig. 53. In such localities it is impossible to prevent the gold from showing, but by a careful contouring of the gold and imparting to it a fine finish, the appearance is preferable to the filing away of so much of the tooth as to enable the operator to fill the tooth without the gold showing, as shown in Fig. 61. The preparation of a cavity like this is somewhat the same as that described for the other. It is not attended with as much difficulty as the other, either to the patient or operator; for it is more easily approached, and the view and manipulation is more direct. A retaining pit is made towards the cervix, and an undercut towards the cutting edge, while a groove is made around the circumference of the cavity as described in the other case.

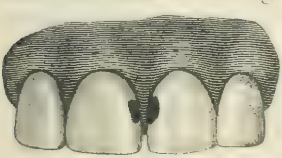

Fig. 60.

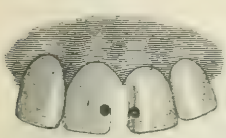

Fig. 61.

Decay is frequently found in the depressions of the enamel on the palatal surfaces of the incisors, more particularly in the *lateral inci-*

sors as shown in Fig. 62. *These* may be regarded as among the most simple cavities to fill. The cavities can be prepared almost entirely with burs in the dental engine. The same directions apply for the filling of these cavities as in the masticating surfaces of the molars. The head of the patient is thrown well backward and upward, so as to afford an approach to these places directly and with facility. It is important, in these cases, to have the rubber dam well applied, as the slightest weeping of saliva around it on the gold, would prevent the gold adhering. The knot spoken of before, in securing the rubber dam to the tooth, is invaluable here as the gum is ordinarily quite tough at this point, and the tooth being shelving, makes it more difficult to keep the dam in place and make it stay without such aid. Frequently when the decay has consumed the tooth *above the gum margin*, it is necessary to resort to the use of a clamp as shown also in Fig. 62.

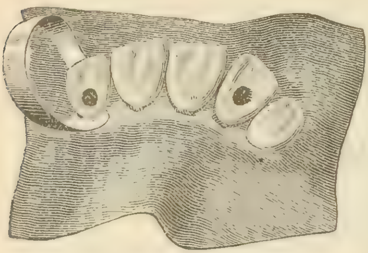

Fig. 62.

There is a class of cavities which affect the teeth on their outer or labial surfaces, some of which are attended with considerable difficulty; but this is more particularly the case in the application of the rubber dam rather than in the filling. We shall treat first the simpler cavities of this kind. These are when the decay is on the labial surface *below* the gum margin, as shown in Fig. 63. In such cases it is possible to apply the dam and keep it above the margin of the cavity of decay without the aid of a clamp; but should this *not* be possible the use of Dr. I. F. P. Hodson's clamp, shown at Fig. 64, will overcome the difficulty. It is only when these cavities are *at the gum margin or above it*, that the difficulty is increased, as shown by Fig. 65. Labio-cervical cavities and clamps to aid in the filling of such cavities with gold, have long been "a thorn in the side." It must be remembered that a clamp will only pinch when its jaws are exactly opposite each other. It is impossible to make a clamp hold on a tooth if one jaw of the clamp is higher than the other. Clamps such as shown in Fig. 66 look very well on paper, but if

Fig. 63.

Fig. 64.

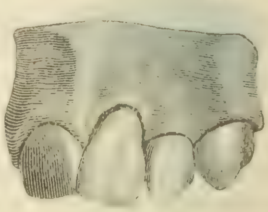

Fig. 65.

the effort be made to use them, it will be found not such "plain sailing" as the illustrations of these clamps seem to indicate. Dr. St. George Elliot has invented a labio-cervical clamp such as shown at Fig. 67. But it is open to the same objection as the others; because it cannot be applied sufficiently high on the labial surface without pinching the gums unmercifully on the palatal surface. A dental friend has had the idea that if a clamp were made so that one jaw could be *padded*, and the padded jaw applied *to the gum* while the other jaw could be placed at any height on the labial surface, such a clamp would be serviceable. Acting on this suggestion we had a pair of clamps made right and left, such as are shown at Fig. 68. A disk of cork or felt was cut and secured with adhesive wax to the cup, A, on one jaw of the clamp, when the clamp was applied. But on trial our friend did not find them to work satisfactorily, whether from faulty construction of the clamp or not, we are not aware.

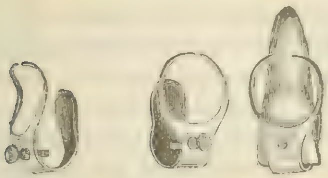

Fig. 66.

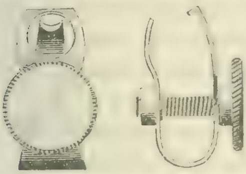

Fig. 67

Dr. How has given considerable attention to cervical clamps. His first effort was a three jaw clamp. The object being that the two lower of these should impinge *the tooth*, while the other should rest against the cervical part of the root and assist in holding back the dam while filling the cavity. But this it does *not* accomplish *in our hands*, because the two lower jaws of the clamp slip off the enamel of the tooth, making the appliance any thing but stable. It is faulty, too, in its mode of application, as the clamp forceps pull it away from the tooth when these are removed; and the application of the clamp with *twine*, as advised by Dr. How, cannot be accomplished when the dam is in position. It *might* be better done by putting on the clamp *first*, and applying the dam *afterwards*; but to do this, quite a large hole must be punched in the dam, to let it pass over the clamp without tearing. Dr. How's later effort is the "cervix screw clamp." The idea in this also is the furnishing of the clamp with *three jaws*, only that in this form the lower two jaws are

Fig. 68.

provided with a screw, by which the appliance may be elevated or depressed to obtain a more stable impingement. We have not tried this form, so we cannot speak of its merits or demerits.

Other devices to this end have been presented to the profession by Dr. T. A. Long, Dr. Johnson's "lever clamp," and Dr. Carpenter's *changeable jaw labio-cervical clamps*, but we can only say that their mode of action is the same as the ordinary clamp, in that the jaws are opposite each other, so that they cannot be applied to suit the cases presented, in labio-cervical decay, different from an ordinary clamp.

We devised a labio-cervical clamp, such as is shown in Fig. 69. A, showing the construction of the device, and B, its mode of application. D. D. D. D. is a spring clamp which is tightened by means of the screw EE. A wire, on the end of which is a tube, passes through the bottom of the clamp GG, and is controlled in its motion by the screw H. Another wire passes through this tube, J., on the end of which is a gum retractor K, and this is controlled by the screw L. In use the clamp is adjusted to an adjoining tooth next the one to be filled, after the rubber dam is applied, when it is firmly fixed in place by means of the screw E. The wire G. is then moved through its socket, and the gum retractor K put in place by elevating the dam above the cavity to be filled. It is then held in place steadily until the screws H and L are tightened so as to keep the dam from slipping down. The device although correct in principle, is necessarily crude, and we doubt not would serve the ends well if nicely made.

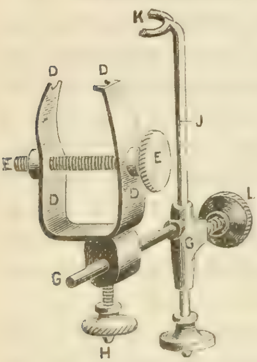

Fig 69 A.

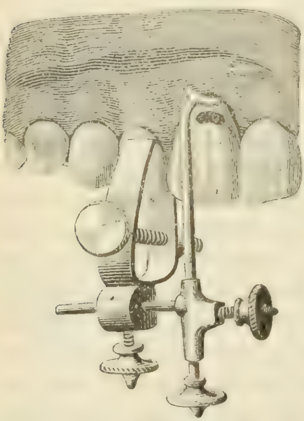
Fig. 69 B.

We presented some time ago "a gum retractor," Fig. 70. By its use these troublesome cavities can be filled; only that it requires *an assistant* to hold the retractor in place, while the cavity is being filled by the operator.

This is not always pleasant to the patient. Our mode of procedure

Fig. 70.

in these cases is to make a superficial preparation of the cavity, and fill it with red or white gutta-percha, crowding this over the edges of the cavity towards the gum margin, so as to produce as much absorption of that tissue as possible; the better to use either a labio-cervical clamp or the gum retractor. Fig. 71 will show the burring over of the temporary gutta-percha filling towards the gingual margin alluded to. To accomplish this, the cavity is prepared with small hatchet, hoe and hook excavators, being very careful, in the superficial preparation, *not to wound the gum*, so as to make it bleed. A mouth napkin is neatly folded under the lips, and the gums adjacent to the cavity made dry with small pieces of spunk or bibulous paper. The gutta-percha is softened in the boiler, the pluggers are gotten ready so as to have all at hand for immediate use. A small probe wrapped with a small bit of cotton floss should also be at hand. Just before introducing the gutta-percha, the cavity should be wiped out with the probe on which there is the *least film* of *oil of cajeput*, and immediately after the gutta-percha introduced, and bulged or crowded over as shown at A, Fig. 71. This oil slightly dissolves the gutta-percha and makes it adhere to the cavity better than if it were not used. If, however, the operator can obtain *a good undercut* or groove to the cavity, the use of this oil can be dispensed with. This temporary gutta percha filling is allowed to remain in place for a day or more, when possible. On the return of the patient to have the tooth filled, the filling is removed and the rubber dam applied. The dam is stretched away from the tooth sufficiently to expose the cavity. The retractor is then placed on the part of the tooth denuded of gum, above the margin of the cavity. It is held immovably by the assistant, his forearm or wrist resting on the patient's head, while his hand holds the handle of the retractor, as shown by Fig. 72.

Fig. 71.

In preparing these cavities *a good, well defined groove* is made around its entire circumference. A cylinder introduced and held in place with an instrument in the left hand of the operator, while it is partially condensed against the upper part of the cavity with a plugger in the right hand of the operator, like the one shown in Fig. 73. Another and another cylinder is thus introduced permitting one end to protrude from the cavity, and the other end to rest on the bottom

of the cavity, until a sufficient number of cylinders are introduced to hold in place. The gold is then perforated in the centre of the filling, making pressure towards the entire circumference of the cavity with a plugger like Fig. 74. The pit thus made by the plugger is filled with small pellets or cylinders of *cohesive foil*, and this is continued until the gold is universally dense throughout. The rubber dam may now be removed, when the filling is cut down to a level with the margin of the cavity, with small, fine grit, corundum points and wheels set on mandrels, and used in the hand-piece of the dental engine. This will constitute the filling of labio-cervical cavities. These cavities are best prepared with excavators instead of burs and drills used in the dental engine, yet they may be prepared either way. A hook excavator makes the retaining groove better than a small round bur in the dental engine.

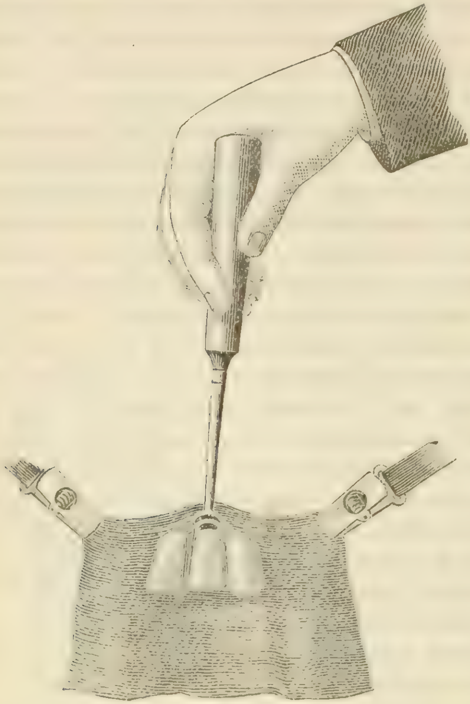

Fig. 72.

Fig. 73.

We have gone over the ground thus far, in demonstrating the filling with gold of simple cavities, in lower and upper molars and bicuspids on their crown surfaces, of cavities in the palatal surfaces of the incisors, of cavities in the proximate surfaces of these teeth, as also in their labio-cervical surfaces.

We propose now to take up the preparation and filling of cavities in the proximate surfaces of molars and bicuspids, as well as when such cavities are compounded with decay on the masticating surfaces.

We will take a typical case of a superior first molar. The first effort will be to obtain room or space by the use of the separator, after the rubber dam has been applied. Decay is detected on its

Fig. 74.]

mesial surface, but has not involved much of the tooth. If such decay inclines towards the *labial aspect*, as shown by Fig. 75, much of the preparation may be accomplished from that surface. The cavity may be started with small *fissure burs* like in Fig. 76, after which *oval burs* like those in the same cut may be substituted, and finally *wheel burs*, that the cavity may have a more definite shape as well as an undercut towards the palatal aspect of the tooth. It *may* be necessary to drill a small retaining pit at this point, the better to start such a filling. If the decay, however, is towards the palatal aspect of its mesial surface, the approach cannot be made from the labial aspect nor yet from the palatal. It must therefore be made from the masticating surface, as shown in Fig. 77, and done at a slight expense of tooth tissue from the masticating surface. The preparation of such a cavity is comparatively simple, and may be accomplished almost, if not entirely, with burs and drills, such as are shown in Fig. 76. A retaining pit may be made in such a cavity, although this may not be necessary. By holding down the first few cylinders or pellets in the cavity, with an instrument in the left hand, until there is sufficient gold introduced to wedge or bind so as to make a foundation, the remainder of the cavity may be easily filled with small cylinders of cohesive gold. Should it be impracticable to hold down the first cylinders in such a cavity, and yet have room to manipulate with the plugger, a simple matrix may be made of a piece of orange wood, cut in the form of a *long wedge* and applied between the teeth *from its palatal surface*. This matrix should be burred out at its upper border, as shown in Fig. 78, so as to afford easy access to the cavity. This burring out of the wooden matrix may be done with a fine cut sugar loaf bur

Fig. 75.

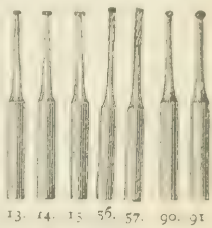

Fig. 76.

Fig. 77.

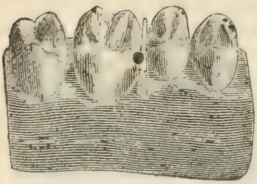

Fig. 78.

245.

[Fig. 79.

as shown in Fig. 79, while the matrix is wedged between the teeth. The cavity may be filled with straight or almost straight pluggers, such as are shown in Fig. 80, and the gold (which should preferably be soft or non-cohesive gold), be well packed against the margins of the cavity next the wooden matrix. When the cavity is about two-thirds full, the matrix may be removed and the gold *thoroughly condensed or malletted down*, after which the remainder of the cavity can be filled with cohesive gold.

Should the decay in the molar tooth occupy a position, either towards its labial or palatal aspects, but be midway between these points, the mode of preparing and filling the cavity will be similar to what was last described, that is, by sacrificing a small portion of the masticating surface of the tooth, in order to gain access, as shown in Fig. 77. But should there be found a large cavity on the disto-masticating surface of the second bicuspid tooth, (which is very frequently the case), this cutting away of the masticating surface of the molar tooth will not be necessary, as an ample approach to the mesial surface of the molar tooth can be made through the opening afforded by the decay in the bicuspid, as shown in Fig. 81, through which opening the cavity in the molar is readily filled. Such a cavity may be prepared with burs in the dental engine, and filled with cylinders or pellets. Pluggers, such as are recommended in Fig. 80, as well as those shown in Fig. 82, may be used with advantage and facility.

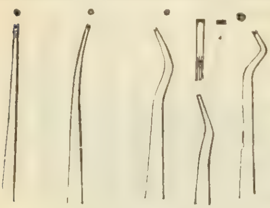

Fig. 80.

Fig. 81.

The cavity in the molar being filled, cut down smooth and polished, attention may be given to the compound cavity in the bicuspid tooth. Fig. 81. Such a cavity can be prepared with burs in the dental engine.

A groove should be made towards its buccal and palatal surfaces, which may be done with hoe excavators; or a slight dove-tailing of the mouth of the cavity may be cut on its masticating surface with small fissure burs in the dental engine. The cavity being prepared it is filled by the aid of a matrix One of Dr. Miller's matrices

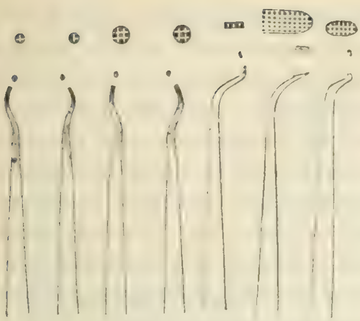

Fig. 82.

will suit well for such a case, and is applied as shown in Fig. 83; a small wedge being used to tighten the matrix, and best (in this case), inserted from its palatal aspect. The cavity should be *two-thirds* filled with pellets or cylinders of non-cohesive gold, using pressure against the matrix as well as against the walls of the cavity next the matrix, and held in place, if they do not keep their place of their own accord, with a small instrument held in the left hand, until a sufficient number of these are inserted so as to keep the gold immovable. The matrix may now be removed and the walls against which it rested should be well examined and carefully condensed to be sure of a close contact of the gold next the margins of the cavity. The pressure should be perpendicular rathert han inward, so as to ensure close contact as well against the perpendicular walls as against the cervical margin. Pluggers such as are shown in Fig. 84 are well adapted, both for this condensing of the gold already introduced, as well as to build out the remaining third of the filling which should be done with cohesive gold. When the cavity is entirely filled, it should be filled rather *over* than short of its margins. The gold should be dressed down even with the edges or margins of the cavity, with emery strips, fine files, or sand paper disks, and made perfectly smooth and polished, when the rubber dam may be removed and the teeth permitted to fall into their normal positions.

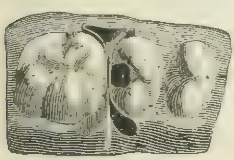

Fig. 83.

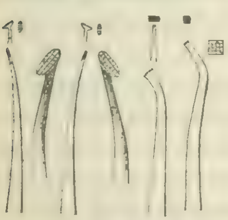

Fig. 84.

In the case which we have just treated, the decay had not extended on its distal surface, down to the gum margin, so that a matrix, such as is shown in Fig. 83, suited the case; but if the decay extended down to or below the gum margin, another style of matrix would have to be used. It will readily be understood that a tooth being narrower at its neck than at its masticating surface a wide matrix, such as are ordinarily sold at the depots would not make a close fit at this part of the tooth. This is better understood by an examination of Fig. 85. The matrix here represented at figure G is the

"Brophy Matrix," M represents the matrix, B the bolt by which it is tightened on the tooth, and D the decay in the tooth. It will be seen that although the matrix is bolted tightly the upper part at the neck of the tooth does not fit close; if, however, a *narrow band*, as in figure H of the same cut be used, the matrix can be made to fit close at that point. For this reason, in filling a molar or bicuspid tooth, where the decay has extended down to or a little below the gum margin, we advise the employment of a narrow matrix *first*. When the gold has been brought up to the level of this band it may be unbolted and a wider matrix used. This procedure also has the advantage that a better view of the cervical margin can be obtained, whereby that vulnerable point may be better filled than if a wide band be used from the beginning of the operation.

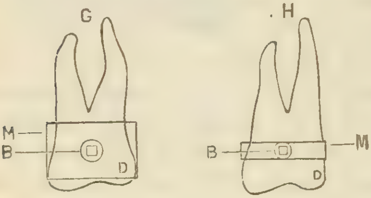

Fig. 85.

Matrices are useful principally to fill molar and bicuspid teeth, and even in these their usefulness is limited to the disto-masticating surfaces. On the mesio-masticating surface they are often a hindrance rather than a help, as in these localities their application impedes the view or shuts out the light from the point it is most important to view with the utmost clearness. If used at all in these localities, a very narrow matrix should be used, so as to secure as clear a view as possible, and used only to secure the foundation of gold whereon to build the remainder of the filling. Of the matrices that are most easily applied, the Miller matrix, the Brophy matrix and the Woodward matrix rank first. The Miller matrix is serviceable only where there is an adjoining tooth to wedge against, as shown in Fig. 81. But should the adjoining tooth be lost (or wanting) these cannot be used. In such a case one of Dr. Brophy's or Dr. Woodward's matrices would be needed. Fig. 86 represents one of each of these matrices, B being the Brophy and W the Woodward matrix, and Fig. 87 shows their application in practice. Of the two forms Dr. Woodward's band matrices have a sphere of usefulness, for these may be used both for gold and amalgam fillings, which is not the case with the Brophy matrix; for in these, if used for amalgam, it frequently happens that when the attempt is made to

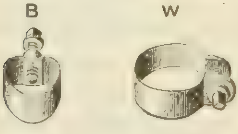

Fig. 86.

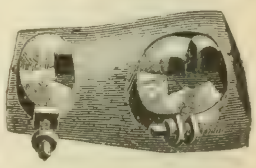

Fig. 87.

remove the matrix after the amalgam has been inserted, the matrix will break away the filling unless the matrix is permitted to remain in place until the amalgam has set *quite hard*; whereas with the Woodward device no fear of this need be had, as the bolt can be taken out and the band straightened and removed without the least fear of disturbing the amalgam. Fig. 88 represents Dr. Woodward's latest device in this direction, but it, like the Miller or Jack devices require a tooth adjoining the one being filled for the matrix to press against.

The cavities of decay which remain to be treated are those found on the buccal surfaces of the upper and lower molars. There are other complications of decay, but were we treat of all possible cases the task would be both interminable to the writer and wearisome and uninteresting to the student. We have therefore selected only such decays and their complications as are most generally found, and these treated as being such as will come under the dentists' care.

Fig. 88.

Cavities in the buccal surfaces of the lower molars when these are above the gum margin are such as may be termed simple cavities. They may be prepared almost entirely with burs in the dental engine. When they present with only a small opening in what is termed "the buccal fissure," an opening may be started with the ordinary fissure drill or bur in the dental engine.

The opening thus commenced is gradually increased by the use of larger and larger fissure burs.

Should the enamel be quite thick or dense, it might be preferable to use small sugar loaf fine cut burs, Fig. 89, to commence the opening, as this style bur cuts the enamel better than the cavity burs do, and are less affected by the rapid revolution of the dental engine. Besides these advantages they leave the borders of the cavity smoother than the fissure cavity bur. The entrance once made, a round or oval bur, Fig. 90, is used to cut away the decayed dentine within. The oval burs will generally give a sufficient groove to the cavity for the retention of the filling, but should they not do so, a more decided or better defined groove may be made with the wheel burs shown also in Fig. 90. The preparation of the cavity is prefer-

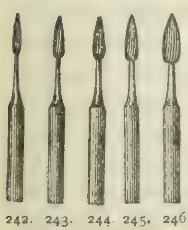

Fig. 89.

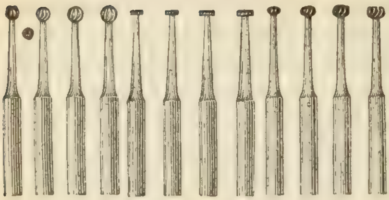

Fig. 90.

ably made by applying the rubber dam *first*, as the chips which accumulate from the use of these burs, may be blown away by the chip blower, Fig. 91, and render the view of the work done, clear and distinct. Such a cavity is filled by the use of cylinders. These are packed into the cavity with one end lying on the floor of the cavity and the other end protruding from it. The first cylinders which should be of soft gold, are packed against the wall of the cavity *farthest from the operator*, and others introduced the same way. Should they not retain their places, a fine pointed instrument held against them in the left hand of the operator, will retain them in position until a sufficient number is introduced to prevent them from moving. The plugger applicable for the packing of these cylinders is shown at Fig. 74, after which the filling is pierced in the center with the same plugger and a facing of the gold is made at all points from the place of piercing towards its circumference. The pit thus made in the filling is filled with small pellets or cylinders of cohesive gold, and the same piercing made at some other point until the filling is thus made dense. A broad-faced plugger, like Fig. 92, is then used to go over the whole surface of the filling, gathering up as it were, the protruding ends of the cylinders and pressing them into the cavity. After this, pluggers with smaller and smaller points are used going over the entire surface of the filling until it is condensed into a solid mass. Any pits left by the sinking of the plugger points into the gold must be filled with small pieces of cohesive gold. The filling is then reduced to the level with the tooth by means of small, fine grit corundum points used in the dental engine and kept wet with water from a pipet, after which it may be polished with wood polishing points secured to a porte polisher, and used in the

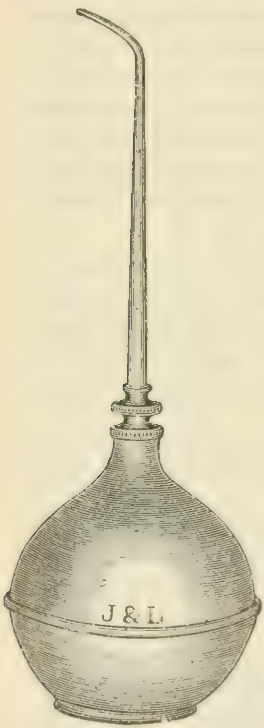

Fig. 91.

Fig. 92.

dental engine or with small leather wheels used in the same way. Fine pumice moistened with water is used to cut the surface of the gold filling smooth, after which whiting or rouge will give the luster.

Cavities on the buccal surfaces of the upper molars are treated in a similar way to the case just described for a lower molar.

When a cavity on the buccal surface of a molar extends down to or below the gum margin, it is well as an initiatory step, to prepare the cavity *superficially with excavators,* being careful in doing this, *not to wound the gum*, by the slipping of the instrument, and then to pack gutta-percha into the cavity and allow this to protrude on the gum, as was advised for filling labio-cervical cavities, and shown in Fig. 71 at A. By such a procedure the gum is forced from the margin of the cavity by this temporary gutta-percha filling, and when the patient presents for the permanent operation, the condition of affairs is more favorable. The first step we would advise in this case would be the application of the rubber dam. But for such a case the clamp would have to be kept on the tooth during the entire operation. Clamps such as are shown in Fig. 93, are indicated

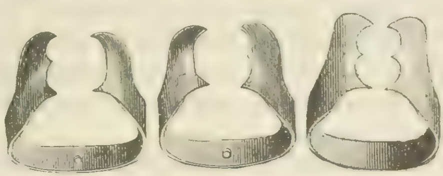

Fig. 93.

for such a case. One of these clamps should be tried on the tooth first to see that it fits nicely, after which it is applied with the rubber dam, in the manner before described. The cavity may now be prepared. The use of hoe and hatchet excavators, such as are shown in Fig. 94, will be found best for such places. A well defined undercut should be made with these instruments; a small wheel bur might be used in the cavity towards its posterior edge and towards its upper border (we are speaking of a lower molar), but the lower border towards the gum margin should be prepared with excavators. The filling of such a cavity is conducted in the same

way as that described for the other. For such cavities in the molars of the upper jaw, the preparation and procedure will be the same, only that different clamps will have to be employed. Such clamps as are shown in Fig. 95, one of which is for the right and the other for the left side, are best suited for the upper molars.

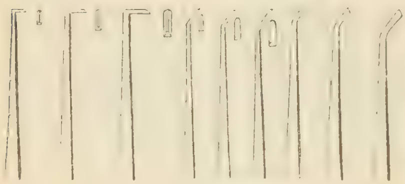

Fig. 94.

In buccal cavities of the wisdom teeth of the lower jaw, the integument of the cheek folds over so much against this surface of the tooth, that such localities are extremely difficult to fill, and ordinarily the tooth protrudes so slightly above the gum and that tissue is so tough in that locality, that it is extremely difficult to apply the rubber dam, even when a clamp is had to pinch the tooth well, so as to hold the dam on: for by the movement or contraction of the muscles of the cheek of the patient, the clamp by its unstable hold on the tooth is easily dislodged. Nevertheless such cavities can be prepared by the exercise of patience and careful manipulation on the part of the operator, and filled with gold in the same way as has been described for other cavities of this class. Such cavities, however, from their extreme inaccessibility and consequent difficulty of manipulation are as well filled with amalgam or gutta-percha; the latter, when it is possible to keep the cavity dry either by napkins, but preferably the rubber dam, being our favorite material.

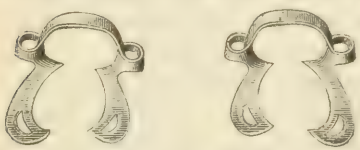

Fig. 95.

We have now described all such cavities as are ordinarily met with, where there are no nerve complications. We propose now to describe such cavities as require the devitalizing of the nerve or the treatment of the root canals from the effect of putrescent pulp, or alveolar abscess.

PRACTICAL PLACE.

Perhaps some of the readers of the *Houskeeeper's Weekly* may care to know how to make the celebrated Javelle Water, which, if properly used, will remove almost any stain from linen or cotton. Here it is: Take two pounds of washing soda, and two pounds of chloride of lime; put them in a stone jar; pour over them two gallons of boiling water. Cover with a thick cloth and board.

Let it stand twenty-four hours; then strain through flannel, and bottle for use. For stains, after the article has been washed, dip for a few minutes in the Javelle water, then rinse well. This may be repeated several times, if unsuccessful at first. A half-pint in a tub of hot water will whiten the wash without injury to the clothes. It is also valuable as a disinfectant in washing clothes worn in illness.

HERE is an ancient and very odd rule for telling the number of days in the month by counting the knuckles. By counting the knuckles on the hand, with spaces between them, all the months with thirty-one days will fall on the knuckles, and those with thirty days or less will come on the spaces. January, first knuckle; February, first space; March, second knuckle; April, second space; May, third knuckle; June, third space; July, fourth knuckle; August, first knuckle; September, first space; October, second knuckle; November, second space; December, third knuckle.

SO FAR as cost is concerned, a bran bath is a luxury within reach of any one. All you need do is to fill a bag with bran, let it soak in your bath for a while, then squeeze the bag, holding it under the water. The water soon becomes opaque, and then is your time to step in. When you step out your skin will feel like marble.

HERE is an easy way to silver ribbons, etc.: Make a solution of nitrate of silver (caustic), and with a quill or camel's-hair pencil draw the pattern on the ribbon. After it is dry, hold the ribbon over a saucer containing water-zinc and one part of sulphuric acid. In a little while the silver will be reduced and adhere well to the article.—*Housekeeper's Weekly*.

Gilding Without a Battery.

According to the *Jewellers' Circular*, articles which do not require much handling may be quickly gilded without a battery as follows: One part of chloride of gold and four parts of cyanide of potassium are dissolved in boiling distilled water; the articles are hung in this solution, tied with a fine copper wire to a strip of zinc, scratched clean, and left in it for a few minutes.

To Unite Metal and Glass.

The uneven expansibility of glass and metal during a change of temperature renders it difficult to unite them. The following cement is as satisfactory as any I have found:

	Parts.
Boiled linseed oil	3
White lead	1
Litharge	2
Gum copal	1

Mix thoroughly and use immediately, as it dries readily. Use plenty of the cement, and see that both glass and metal are free from grease or dirt.

Pineapple Juice for Diphtheria.

Medical science has long sought for a sovereign remedy for the scourge of childhood, diphtheria, yet the colored people of Louisiana. and perhaps of other localities in the South, have for years known and used a cure which is remarkable for its simplicity. It is nothing more nor less than the juice of the pineapple.

"The remedy is not mine," said a gentleman when interviewed; "it has been used by negroes in the swamps down South for years. One of my children was down with dipththeria, and was in a critical condition. An old colored man who heard of the case asked if we had tried pineapple juice. We tried it and the child got well. I have known it tried in hundreds of cases. I have told my friends about it whenever I heard of a case, and never knew it to fail. You get a ripe pineapple, squeeze out the juice, and let the patient swallow it. The juice is of so corrosive a nature that it will cut out diphtheritic mucous, and if you will take the fruit before it is ripe and give the juice to a person whose throat is well it makes the mucous membranes of his throat sore. Among those who have tried the cure on my recommendation I may mention Francis J. Kennett, the Board of Trade man, whose children were all down with diphtheria, and were cured by this remedy."

Mr. Kennett confirmed this statement.—*Chicago Tribune.*

An excellent and quick way to mend broken plaster casts and impressions is to paint the broken surfaces over two or three times with a very thick shellac varnish, and at each application to burn out the alcohol over a flame. When the shellac is sufficiently soft, press the parts together, and hold in position till cool. It will be as strong as it was before broken —*Scientific American.*

Files can, it is said, be recut by cleaning them in acidulated water between two plates of carbon and closing the circuit so as to form a real voltaic cell.

LABEL PASTE.—J. F. Patton states that while making flour paste one day it occurred to him that, by converting part of the starch of the flour into dextrine by the action of an acid, he might improve its adhesiveness. Accordingly, he added some hydrochloric acid, and the result was better than anticipated. The product was a very white, smooth paste. With this paste he found no difficulty in attaching labels to tin or other smooth surfaces. The following is the formula he used:

Wheat flour	1 pound.
Alum	2 drachms.
Borax	2 drachms.
Hydrochloric acid	½ ounce.
Water	16 ounces.

Mix the flour, alum and borax, and stir to a smooth paste with the water; then add the acid and heat until the starch cells break, stirring constantly.

This makes a very thick paste, which must be thinned with water as wanted for use. A small quantity of essence of wintergreen poured over the paste in stock will preserve it indefinitely.—*Pharmaceutical Era.*

LOCAL ANÆSTHETIC.—

℞.	Cocaine Mur	gr. 50
	Acid Boracic	gr. ii.
	Liq. Hyd. Bichlor	m. 40
	Aquæ Destil ad	m. 250

Soak two rolls of cotton wool well with the solution, holding them in position for about two minutes, then operate with warm instruments.—*Dr. E. M. Tod.*

CEMENT FILLINGS give way at the cervical border because they have been left imperfect at that point. If, at the time hardening commences, they are closely adapted by pressure, and then hardened when thus subjected to close adaptation (generally to be secured only by the aid of matrices), they will last as long at the cervical border as at any other point.—*Western Dental Journal.*

ELECTRICITY moves 288,000 miles per second, light moves 192,000 miles per second; a rifle ball moves 1,460 feet per second.

TO MAKE waterproof writing ink, an ink which will not blur if the

writing is exposed to rain: Dissolve two ounces shellac in one pint alcohol (ninety-five per cent.), filter through chalk and mix with best lampblack.

Periosteal Inflammation.—I have found, sometimes, after treating sore teeth for several days without giving relief, and where the trouble was somewhat obscure, and had probably been diagnosed as periosteal inflammation, or something of a kindred nature, that a pill of calomel, 2 grains, soda bi-carb., 3 grains, taken just before retiring at night, brought things all straight next day. Try it on your next patient with a sore tooth. It certainly holds good in malarial districts.—*A. H. Hilzim.*

Root-Filling.—The first thing necessary, after the pulp is removed is to get rid of as much of the contents of the tubuli as possible. For this purpose there is nothing better than heat. Dry the tooth with the hot-air syringe and then pass up a root-drier, after which treat the root antiseptically. I am in the habit of filling always with oxychloride of zinc, because of the antiseptic character of the chloride. It will prevent further decomposition as far as anything I know of. If the dentine is made perfectly antiseptic, a point which is too often overlooked, no further trouble need be apprehended. Where the pulp has been long dead, and the tubuli are filled with dead and decomposing organic matter, I inject peroxide of hydrogen, drying the root thoroughly first. The peroxide will reach it readily and drive it out, the injections being repeated as long as there is any indication of decomposed matter.—*Dr. W. W. Allport.*

Dr. G. A. Bowman says painless dentistry is a misnomer. There is, in the nature of the case, no such thing. We, as dentists, are working upon as highly organized tissue as there is in the body, with implements no softer than steel. Then how can we, or our patients, be deceived into believing that operations on these organs can be made absolutely painless? It's a mistake.

Pain is manifold, in kind and degree. Mental suffering is, many times, far more painful to bear than physical suffering: and thus our patients suffer when they think of paying us a visit, long before they take a seat in the chair, which focalizes and intensifies their agony. The first thing to allay is this dread; this mental monster must be laid low, through sympathies and kindness, assurance that the Philistines are dead, and friends are near. Gentleness, quietness: let

everything that pertains to the operation be kept in the rear. Have something patients can see that will amuse and delight them; let sunshine into your operating room; be cheerful yourself. There is no one rule which, followed, will bring peace: nor one medicament which will in all cases obtund sensibility; but much suffering can be avoided by using the means already suggested by previous speakers.

Dryness, warm air, and warm applications: even these give more or less pain, unless adroitly used. Caustic-potassa is most *heroic*, and most useful. * * *—*Archives of Dentistry.*

Coal Gas in the Dental Laboratory.

Selections—Zinc.—Casting dies may be now considered, and here comes in the ladle furnace for zinc melting. This will melt seven pounds of zinc or alloy in fifteen minutes, giving time to prepare the sand moulds. When the zinc gets thick and unsatisfactory, the same ladle furnace is used to heat it to dull redness, when a tablespoonful of strong hydrochloric acid thrown on it whilst stirring with a stick or an iron rod, will instantly render the zinc perfectly fluid and equal to new metal. Lead or tin for counter-dies can be prepared with the same furnace in about eight minutes, or less; and this brings us to the treatment of the plate.

Blow-Pipes.—Speaking for myself, I consider the hot blast blow-pipe with bench light the perfect apparatus for dental work. Many will agree with me, many will not, and I leave the matter open for each to use the blowpipe he can do the best work with.—*Thomas Fletcher.*

"Dorrance's Alloy."—This alloy is made of silver, 1 part; zinc, 2 parts; and copper, 3 parts (metals must be pure), and is used to alloy gold or silver plate for making solders. It makes a strong, easily flowing and tough solder that follows the color of the plate from which it is made. I prefer it to the solders that I have been able to buy, and can profitably use my plate scraps. If the dental depots would furnish this alloy they would do the profession a service.

Fragments of roots broken off in extracting, can often be easily removed by burring away the alveolar process immediately surrounding them, thereby avoiding much pain and laceration. It would be an advantage if the dental instrument-makers would make some burs with long shanks for this purpose.

It is sometimes advantageous to make a model of plaster and sand, and when the work is adjusted do not remove from the model, but

add enough more plaster and sand to hold the parts in position, remove wax and solder.—*Ohio Journal.*

Retaining Dressings in Teeth.—The following is a method I have found very useful in retaining dressings in teeth that have been fractured by an accident; or where the walls of the cavity are so broken down as to prevent the possibility of retention by any other method. Take a piece of rubber tubing, such as is used for regulating, and of requisite calibre to pass readily over the tooth, cut to length required to envelop crown of tooth. To facilitate application where the teeth are close together, soap the tubing slightly, then, with the aid of a pair of right and left burnishers, or other suitable instruments it can readily be carried to place. When *in situ* the band covering point of application can be distended, application made, and band allowed to assume its original position.

The merits of this method of securing cervical applications are obvious, and it will also be found useful in many other cases.—*W. Mitchell, D. D. S., in Dental Review.*

Laboratory Hints, by Dr. Bartlett.

I try to do as little hammering as possible in swageing a plate, for I find that the more one hammers his gold, the more unyielding his plate, or gold, will become.

Sometimes in swageing a partial or full plate there will be a spring in the plate, which it seems almost impossible to get out: and after spending half a day in vain to remove it, one is often tempted to throw it away and commence anew. Should you ever get a spring in a case of this character, all the pounding you can give it in a day will not remedy it. I treat such cases in the following manner: Take the plaster model which is used in making the dies, and set the plate upon it, and in as nearly a correct position as possible, and on the side of the model cut some small grooves at different points. Force the plate down into the face of the model, into the desired position, and at the same time pass over it a piece of copper wire (size 21 of standard gauge), carry the ends of this wire around the model, bringing them together and twist them until the wire binds down the plate to the model. Use as many wires as are necessary to bring down the plate all around. Then heat the plate to cherry-red, and allow it to cool slowly. After removing the wires, you will find that the spring has departed This same method can be applied to plates with teeth, by investing in sand and plaster after having applied the

wires, and then slowly heat the mass upon a lamp or furnace before using the blow-pipe.—*Archives.*

IN EXTRACTING *teeth for very nervous persons*, I find that sulphuric ether, used on a small piece of sponge, and rubbed on the face, near the lobe of the ear, quiets them, and appears to lessen the pain. This is good, in conjunction with electricity; but don't use it too often on the same patient.

In extracting teeth for a full upper denture, the canines are the most stubborn; but, after taking out all the other teeth, if you will catch them on the sides, well up on the cervical border (cutting through the alveolar process), you will have no trouble.—*Dr. A. D. Penny in So. Dent. Jour.*

ANTISEPTIC MOUTH WASH.—Dr. W. D. Miller, in his work on "Micro-organisms of the Buccal Cavity," recommends the following antiseptic mouth wash:

Thymol	gr. ii.
Benzoic Acid	scr. ii gr. vi
Bichloride of Mercury	gr. ix.
Tr. of Eucalyptus	dr. ss.
Oil of Peppermint	gr. xi.
Alcohol	OB. iii. dr. ii.

This is filtered and sufficient of the solution is added to a wine-glass of water to cause a distinct turbidity. The mouth is rinsed with this mixture twice successively, and may thus be kept perfectly sterilized, the amount of bichloride being too small to cause poisonous effects.—*Ex.*

A NEW alloy has been discovered by Herr Reith, of Bockenheim, Germany, which is said to practically resist the attack of most acid and alkaline solutions. Its composition is as follows: Copper, 15 parts; tin, 2.34 parts; lead, 1.82 parts; antimony, 1 part. This alloy is, therefore, a bronze, with the addition of lead and antimony. The inventor claims that it can be very advantageously used in the laboratory to replace vessels or fittings of ebonite, vulcanite, or porcelain.

A PLASTER CAST of a nose, or any external organ which has deep undercuts, may be made as follows: Melt paraffine in a water bath,

and with a soft brush paint the tissue over, laying on the first coat very quickly. Continue to add paraffine until a coating an eighth of an inch thick is obtained. This can be separated by cutting at the necessary points, and again placing the parts in contact, when the plaster cast may be made, pouring the batter in and out two or three times, to avoid air bubbles.—*Exchange.*

CLEAN JOINTS.—I have seen many enquiries and suggestions in our journals in regard to making sightless joints in putting up sets of section teeth on rubber, or when rubber is used as an attachment, but in all I have never seen any suggestion to the following method, which I have adopted with success, and give for the benefit of the readers of the *Archives*: When the case is flasked and ready for packing, I first cover each joint with a strip of No. 30 gold foil, one-fourth of an inch in width, burnishing it down evenly, and holding it in position with a small piece of pink rubber. I then pack as usual, and find, after vulcanizing, the joints perfectly clean, as no rubber can be forced through the gold strips into them.—*Dr. B. Q. Stevens, Archives.*

FOR FRECKLES.—To remove freckles is not exactly in the line of the practice of physic, but to be able to do so is often to gain the good will of the ladies. For slight cases of freckles, Prof. Geo. H. Rohe, in the *Maryland Medical Journal*, gives this prescription:

℞. Sodii boratis..ʒ ij
Potassii chloratis ....ʒ i
Glycerini...f ℥ ss
Sp. vini rectif.......................................f ʒ ij
Aquæ rosæ q. s. ut ft..............................f ℥ vi

Misce. Sig. Apply with a soft sponge several times a day.

TO GET pure alcohol I hang a piece of gelatine in the bottle. It will absorb the water and leave the pure article without distillation.

HEAT red or white gutta-percha on a procelain slab until sufficiently soft to be kneaded full of oxide of zinc: this makes an excellent temporary filling.

IT is a waste of time to varnish and oil flasks: to part the investing, oiling is sufficient in all cases.—*Dominion Dental Journal.*

Prof. Alex. Winchell's Paste.

We published in our *March* issue the manner of making this valuable cement. Since giving the formula, which we gleaned from the *Nat. Drug.*, we have made some and tried it. and give our testimony as to its efficacy. It is a wonderful sticker, and wishing to report on it, not only as an adherent for labels, but for its use in the dental laboratory, we broke off a tooth from a plaster model, and readjusted it with some of the paste. The plaster tooth was held as firmly as if it had never been broken. The directions say "pulverize the gum arabic, and dissolve it in as much water as the laundress would use for the quantity of starch indicated." As this direction is a little ambigious, on account of perhaps not having a laundress in the house, we will say that we ascertained that the necessary quantity of water would be *a half-pint.* The plaster model should be thoroughly dried, and a very small quantity of the cement used. As an ordinary paste it "holds on" with a bull dog's grip. We have used it on leather and on glass, and to these it adheres with like tenacity, while on bright tin—that substance which is a most crucial test for any paste—it sticks with no diminution of force. We again commend it as a valuable material in the laboratory or office.—*Ed.*

Chloride of Zinc Root Fillings.—Dr. Truman.—The question that has given him the most thought is, that no filling in a tooth root can be perfect; and why? Because the largest part of a tooth is a tubulated structure. These tubules hold organic material, and when the pulp dies, this organic structure dies, and decomposition takes place at once, sulphuretted hydrogen being evolved to become a source of trouble. When the central canal simply is filled, this dead material is buried up, and, in the course of time, you have discoloration of the tooth. Any filling of the contral canal only, must be a partial failure, He had reached the conclusion that in filling a root, account must be taken of the contents of the tubuli. The question then is: What agent will best prevent their decomposition? From experiments, he had settled down upon the coagulators as best adapted for the purpose, because they change the character of the organic material in the tooth. Chloride of zinc is one of the best of these, because of its affinity for moisture; it will follow moisture to the extremities of the tubules, change the character of their contents. and prevent their decomposition.

Packing Plain Teeth,

Or any case where it is desirable to use pink rubber and have it re-

main in place. Warm the case with dry heat before packing, and thoroughly paint the parts, where the pink is desired, with pink rubber dissolved in chloroform ; keep it warm till the solvent is all evaporated. The pink rubber can then be placed in position and kept there while packing the other rubber. It does not hurt if the pink solution gets into the pins, as it is too thin to form a part of the body of the plate.

By this process I find no difficulty in packing my best cases of plain teeth, and having the pink rubber where I wish it, and no black or red rubber showing through it.

By taking pains in packing between the teeth with small pieces or strips, there is no need of getting a particle other than the solution on the pins, and, by using a little common sense, those who often found their best cases unsightly and unsatisfactory will be surprised at the result.

A Peculiar Effect of Cocaine.

Dr. J. W. Stickler reports in the New York *Medical Record* a singular experience with cocaine. An adult in good general health came to his office complaining of severe toothache. To relieve the intense pain, the doctor injected, hypodermically, in the cellular tissue between the cheek and gum, opposite the left wisdom tooth, about five drops of a four per cent. solution of cocaine. Almost immediate relief from pain was experienced, but in less than five minutes the entire left side of the face became enormously swollen, tense and painful. The inner surface of the cheek projected so far into the oral cavity as to render perfect closure of the mouth utterly impossible. So rapid and extreme was the swelling of the soft parts, that the doctor concluded he had punctured one of the larger blood-vessels, thus permitting a free outflow of blood into the loose connective tissue of the cheek. In the course of an hour the pain became so intense, and the tension so great, that it was determined to relieve him by operative measures, so certain did it seem that the swelling and tension were due to the escape of blood, which had coagulated, and could in that condition be easily removed. The patient was therefore anæsthetisized, and an incision made through the mucous membrane of the cheek and the underlying tissues sufficiently deep and long to permit the introduction of the index-finger, with which every part of the interior of the cheek was examined without finding any evidence of the presence of a large blood-clot. This was quite a surprise, for not only was the cheek enormously swollen and tense, but semi-fluctuating to the touch. The slight hemorrhage

from the small vessels along the edges of the cut tissues diminished appreciably, for a few moments, the swelling of the cheek, but shortly after the wound made by the knife had been closed, the tension and swelling became as marked as before the operation. This condition was not wholly relieved for several days. "It is probably true," writes the author, "that the swelling of the cheek, in this case, was due to the paralyzing effect of the cocaine upon the vasomotor nerves, causing thus a dilatation of the blood vessels, with consequent intense congestion. Having had this experience, I would not again inject a solution of cocaine (even a four per cent. solution) into loose areolar connective tissue in the region of the face, without, at least, informing the patient of the possible result, and I am quite confident that if my patient had known, prior to the injection, what he subsequently learned about the peculiar effect of cocaine upon him, he would have objected to its use. I consider the employment of a ten per cent. or fifteen per cent. solution of cocaine both unnecessary and hazardous for the production of local anæsthesia, such as is necessary for the painless removal of small tumors. Cocaine is an agent of great power and usefulness, but one which must be used with great caution."

TOOTH WASH.—G. A. R., Brooklyn: If the wash is wanted as a cleanser of the teeth, the following, from Snively's "Manufacture of Perfumes," will answer:

SAPONACEOUS TOOTH WASH.

White castile soap	3 ozs.
Oil of orange peel	10 mins.
Oil of cinnamon	5 mins.
Water	4 ozs.
Alcohol	12 ozs.

Shave the soap into ribbons: melt with the water in a water bath, adding the alcohol while still warm. Continue the heat if necessary until solution is effected. When cold, dissolve the oils in the liquid.

If the wash is wanted simply as a mouth perfume to be used after cleaning the teeth with water, or water and soap, the following recipe will prove very satisfactory:

EAU DE BOTOT.

Oil of peppermint	30 mins.
Oil of spearmint	15 mins.
Oil of cloves	5 mins.
Oil of red cedar wood	60 mins.

Tincture of myrrh........................ 1 oz.
Alcohol.. 1 pt.
Cochineal coloring, sufficient.

Care must be taken not to confound the oil of cedar tops with the oil of the wood. The former has an odor like turpentine; the latter has the fragrance of the cedar wood.

ALVEOLAR ABSCESS TREATED SURGICALLY.

By R. B. Adair, D D.S.

Read before Georgia Dental Society, 1889.

As Chairman of your Committee on Anatomy and Surgery, I have to report no paper from any other member of my Committee. I urged each to a sense of duty, but they failed to respond with an offering.

I have prepared this paper as a clinical report of several cases in orthodontia and surgical procedure in alveolar abscess.

There is really nothing new to report in the surgical field of our specialty. Implantation, which has been a theme for hundreds of articles and endless debates, has had its day, and will soon be numbered with the operations of the past. We have had some time to take evidence for and against the operation. I am sorry the testimony prevails against it.

Case 1. Chronic Alveolar Abscess, over root of left superior lateral incisor: Mrs. P.——; age 35. Tooth had been treated and filled a year or two previous to the time I first saw it, which was October, 1886, when I took out old root filling, which was partly cotton and partly gutta-percha.

The case very soon, say in about five months, began to suppurate and discharge at same old fistula, so much so as to annoy my patient.

I had just gotten back from my trip of investigation, and decided to try the treatment of Dr. Patrick, of Belleville, Ill., which consists of a delicate bulb made of platinum and slightly curved at end, so as to make it follow track of pus.

The point is heated to red heat and pressed on a stick of nitrate of silver, which adheres to the point and hardens, when it is carried to the bottom of abscess and turned around, so as to cauterize edges of necrosed bone and destroy the micro organisms, and stimulate to a healthy action.

I kept this treatment up for a few weeks, repeating every day or two, until the discharge had almost ceased, though not cured, and quit treatment.

Last August she presented herself again for treatment. Discharge more profuse than ever before, and considerable absorption of both plates of alveolar process.

I decided then to try a little surgery on the case. She, being a very intelligent lady, was willing to submit to anything to save the tooth.

I made an incision just at a point externally to the apex of the root and walls of the abscess cavity in the bone, where necrosis had destroyed it. I then, with a fine cut burr in the engine introduced through opening, proceeded to burr off end of root as smoothly as I could from sense of touch, after which I scraped the edges of the bone in every direction with a sharp, curved, spoon shaped instrument, until satisfied I had removed all softened or diseased bone. I then, with a hypodermic syringe, curved point, thoroughly syringed out the cavity thus operated upon with H_2O_2 dismissed the case until next day, when I injected H_2O_2 mixed with equal parts of a 500 per cent. solution of bichloride of mercury, once or twice substituting one drop of creosote instead. The case made a rapid recovery.

Case 2. Countryman; sanguine temperament; age about 35— Called to consult me about an alveolar abscess that had been discharging through a fistulous opening for thirteen years, pieces of bone frequently working out through the fistula. After examination I found the external plate of bone over right upper lateral incisor entirely gone, and some detached pieces working out. I probed the abscess cavity, and found it to extend very near nasal process, and large enough to receive the end of my finger. I extracted the tooth because he lived some distance in the country, and could not have it treated.

After extracting tooth I took a spoon-shaped instrument and scraped all detached pieces of bone and edges of walls of pus cavity. I then syringed it out with equal parts of peroxide of hydrogen and bichloride of mercury, 500 per cent., and dismissed the patient. I saw the case 10 days after and it was healing nicely. I here exhibit the tooth, which has no sign of decay.

The man said he had never received any blow on the tooth, and did not know why it abscessed. It is a very interesting case, because it shows, as you will see, that tartar can and does accumulate, where no opening exists from gum margin, as the peridental membrane is intact and healthy all around the tooth up to near opening.

I have always contended that tartar had never been found on the root of a tooth, anywhere, that did not insinuate itself from the gums, and make an opening as it went. I am not yet prepared to acknow-

ledge that this proves to the contrary, but it is strong evidence that it can and does deposit, from uric acid in the blood, on the roots of the teeth, when no tartar is found on the exposed parts of the teeth; and may help to give some light on the pathology of pyorrhœa alveolaris.

Case 3. Mrs. S——: Alveolar Abscess—Married lady, has several children, age about 35. Alveolar abscess on apex of left superior lateral incisor; been running about two years; bone around apex destroyed, forming a cavity about large enough to insert little finger.

I opened out pulp chamber and tried to cure in my usual way; by pumping, first, peroxide of hydrogen and bicloride through the tooth and out fistula, and afterwards with creosote on cotton, sealed up within nerve chamber, and over it cotton and varnish; but it would not yield to treatment.

I want to call your attention to the character of the discharge, which is not like the pus that is ordinarily seen discharged from abscesses, but it looked like thick oil.

I have seen but few cases with this peculiar discharge, and have always found them troublesome to handle; and I could not account for this peculiarity, until about two years ago, while in Belleville, Ill., with Dr. Patrick, in describing to him a case I had tried to treat, he explained to me where this peculiar kind of pus came from, or, rather, why it was of oily appearance.

He said that it was always an indication that the lining membrane of the antrum hymore was involved and inflamed; and that that member exuded, when inflamed, just that peculiar pus, etc.

After calling attention to this point in the case, I will say that I cured the case by making an incision through the gums into the pocket, and polishing off end of root with spoon shaped instrument and engine bur. I scraped edges of necrosed bone thoroughly; and after a few days treatment, injected, through opening made, peroxide and bichloride, equal parts, and put cotton saturated with creosote in pulp chamber. I changed cotton every day. The case cured up rapidly.

AN OPEN LETTER TO DR. L. P. HASKILL.

FOR THE ARCHIVES.

You ask why the absorbtion is greater in the lower than in the upper jaw. There are two causes. The lower alveoli is thinner, and

the same appears greater when it is not so; gravitation of food, pressure of tongue and lips, and usually pyorrhœa alveolaris attacks the inferior first.

Your heavy plates are wrong. It is not weight, but size, fit, and articulation that holds the plate.

In taking an impression for a lower flat jaw, use a flat cup nearly as large as will go into the mouth (plaster thin), to force the cheeks and lips out; after it is adjusted, raise the tongue and work it from side to side until the plaster sets; when it is out, feel alveolar ridge, then scrape the center of the bottom from the second molar on each side—and in some jaws there are two ridges where the molars were: each should be scraped separately, and where there are any lumps or sharp edges, scrape also, so the plate will press hardest on the soft parts. The plate should have a wide rim on the labial side—for the cheeks and lips to hold to its place.

On the lingual side leave it flat and as wide as the tongue will permit, and concave from the edge to the teeth, to give room to the tongue.

For a high ridge, scrape so as to raise the plate off the top, or high parts, and do not let it run too low down.

Have not said anything about upper plates, as you understand how to make them; only don't let it run on the soft palate.

To get an articulation, put tri-plates in the mouth and mark center; adjust teeth on both plates; have bicuspids and molars as long as incisors; have patient standing, as they bite truer than when sitting; after closing the mouth, holding upper plate with the tongue, look at it; if it is not right, change the teeth till they are, fasten with wax and put them in a Bonwill articulator, which permits of the lateral and forward movements of the jaws. If the bite is right, and teeth proper length, there will be a harmony of the face, lips and teeth. Grind the lower front blocks first, then the upper front blocks; move the articulator so as to have the lateral and forward movement of the jaw.

Grind the lower bicuspids next, then the upper bicuspids: leave them long enough to allow the incisors to slide past one another with the different motions; make the first lower molar a little shorter than the bicuspids, and the second molar a little longer, with the back corner a little higher than the front corner. The upper molars: The first tooth should be the longest, and set so as to articulate with the first lower molar; second upper molar should be shorter, so as to barely touch the lower molar: so when the teeth are closed the lower plate will be held from protruding.

The outer rim will assist in holding it down and to its place. I have made lower plates seven-eighths of an inch wide, worn with comfort.

Make the hardest bite on the bicuspids, to make pressure on the middle of the plate. Send me your book.

Bourbon, Mo. SOL. HORINE.

ANÆSTHETICS AND ANODYNES.

Judging from the number of patents granted for anæsthetics and anodynes for the relief of pain in the extraction of teeth, there must be a growing demand for such preparations, or an epidemic of investigation in that line. For the quarter ending with March, we find in the *Patent Office Gazette*, three patents for anæsthetics and anodynes. We give abstracts of the specifications as far as they relate to the medicines used in the compounds.

Dr. Eugene F. Jaques, Burton, Ohio: My invention is in the nature of an anæsthetic, to be applied locally by hypodermic injection, and it is specially designed for use in the extraction of teeth.

In compounding my anæsthetic, I take the following ingredients: hydrochloride of cocaine (erythroxylon coca), two grains; carbolic acid (acidum carbolicum), one minim; oil of wintergreen (oleum gaultheriæ), three minims; oil of mustard (oleum sinapis), one minim; alcohol (spiritus purificati), two minims; pulverized boric acid (acidum boricum, pulv.), one grain; distilled water (aqua distillati), forty-nine minims; and oil of cajeput (oleum cajeputi), one minim.

The manner in which I mix and compound these ingredients may be described as follows: I first mix together two minims of alcohol, three minims of oil of wintergreen, one minim of oil of mustard, and one minim of oil of cajeput. I then mix together forty-nine minims of distilled water, one grain of pulverized boric acid, one minim of carbolic acid, and two grains of hydrochloride of cocaine; and finally, I mix the entire mass together.

I apply my anæsthetic locally, by means of a hypodermic syringe, in the well-known manner, using from two to twelve drops to a tooth, applied to both the inside and outside of the tooth, piercing the gum under the mucous membrane surrounding the tooth; thus producing insensibility to the part applied, enabling the operator to use the lancet, making the tooth more accessible, and the operation more sure.

Dr. Alfred Clark, Montpelier, Vt.: Composition of matter to be

used for removing the sensibility of the gums and jaw in extracting teeth, of which the following is a specification :

My composition consists of the following ingredients, combined in the proportions stated, viz : Chloride of sodium, two grains : hydrochloride of cocaine, two hundred grains ; chloral, one grain ; essence of peppermint, one grain ; and carbolic acid, one-half grain. The dose for use when teeth are to be extracted must vary with the case in hand, as from two to five minims. The salt in this composition lessens the soreness and swelling of the jaw.

The carbolic acid is useful in cleansing any ulcer or abscess, and will hold nausea in check. The peppermint, as well as the carbolic acid, will resist this feeling of sea-sickness which cocaine alone might cause.

If the cocaine were used alone, it might also cause a swelling of the tissues of the jaw and face. These ingredients are to be thoroughly mingled by agitation. In using the above-named composition, apply it to the gums near the teeth to be extracted, and also inject it into the gums from three to seven minutes before beginning the operation of extracting the teeth.

By the use of the above-named composition, the sensibility of the gums and jaw is removed, and the teeth extracted without pain to the patient, who retains his or her senses unimpaired. Invalids suffering from heart disease or other ailments that prevent the use of chloroform, ether, or gas, can safely use the above composition, and in many such cases the patient will receive positive benefit from its use.

Dr Robert A. Graham, Carrollton, Ohio: My object is to provide a simple, safe, and effective compound, adapted for use in the practice of dentistry, or for minor surgical operations, which will render painless the extraction of teeth, and at the same time will not in any wise effect the health of the party upon whom it is used.

My improved compound consists of the following ingredients, combined in the proportions stated, viz.: Alcohol, five and two thirds drams : glycerine, two and one sixth drams ; tincture of aconite, one-sixth dram ; menthol, ten grains : sulphate of cocaine, thirty-five grains. These ingredients are to be thoroughly mixed, and the compound should always be well shaken before using.

Where this anæsthetic is used for preventing pain in extracting teeth, three or four drops are injected into the gums on each side of the tooth with a hypodermic syringe, and from thirty to ninety seconds allowed to elapse before proceeding to extract the tooth. For minor surgical operations the compound is applied locally to the parts.—*Dental Advertiser.*

BOOK NOTICES.

The Students' Manual and Hand-Book for the Dental Laboratory. Second Edition. By L. P. Haskell, Professor of Prosthetic Dentistry, Dental Department of the Northwestern University, Chicago. To which is appended Dr. E. H, Angle's System of Appliances for Correcting Irregularities. Published by the Wilmington Dental Manufacturing Company. Philadelphia, Pa. 1890.

The above volume comes to us enlarged and improved in its second edition, and contains much information, briefly conveyed, in its pages. Books of this kind do an immense amount of good, for what is said is said in as few words as possible. and to the point.

Besides its valuable features for the student—and to the practitioner also—the introduction in its pages of Dr. Angle's system of appliances for regulating malposed teeth, will be hailed by many practitioners with pleasure, as holding between its covers a system by which nearly every case of irregularity has an exemplification.

A New Medical Dictionary, including all the words and phrases used in medicine, with their proper pronunciation and definitions. Based on recent medical literature. By George M. Gould, B A., M. D., Opthalmic Surgeon of the Philadelphia Hospital and Clinical Chief Opthalmological Department, German Hospital, Philadelphia. Elaborate tables of the Bacilli, &c., &c. Small octavo edition, 520 pages. Published by P. Blakiston, Son & Co. Philadelphia. 1890. Price, half-dark leather. $3.25; with thumb index, half-morocco, marbled edges, $4.25.

The above valuable work, both for the physician and dentist, deserves to be in the library of all practitioners. Since the publication of Dr. Dungleson's dictionary, there has been no work of the kind which has so wide and valuable a scope. One of its many recommendations is its conciseness. As the author remarks in his preface, "It would not have been half the labor to make a volume double or treble the size as this one," it is herein lies the labor of preparation—which to retain and which to exclude. It neglects nothing to make it reliable and of positive value. The size is handy, the type clear, and the entire work one that commends itself to all who need such a book of reference.

Besides its other recommendations, it contains very many valuable tables and statistics, and a profuse exhibit of the analysis, temperature and hygienic nature of the mineral spring waters of the United States. ED.

THE

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FOURTH SERIES.

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OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S.

(Continued from page 142.)

In our former papers we described the filling of such cavities in the teeth that were most ordinarly met with, yet with no nerve complications. In the continuation of our subject, we advance to the filling of such teeth wherein the nerve is exposed or nearly so, which require at our hands either the capping or the destruction of that organ by devitalization.

A patient will present undergoing considerable suffering. What are we to do? After an examination we find perhaps a lower bicuspid to be the cause of the pain. (We mention this tooth, but the cause may exist in any of the teeth.) Our first effort is to quiet the toothache. The cavity should be cleansed of all particles of food by the most careful use of the excavator. The rubber dam should then be applied and the cavity made dry. Applications of chloroform should then be made with a view to restoring quiet. When this, which is applied on a small pellet of cotton or a small piece of spunk, has dried, should softened decayed tooth tissue so fill the cavity as to make it too shallow to hold any application, the decay should be very carefully removed, cutting or scraping, so as to peel off the decay in such a direction as to prevent the excavation from wounding the nerve. In doing this, should the excavation accidentally uncover the nerve, almost immediate relief may be afforded by the application to the exposed nerve of small pellets of cotton moistened with the tincture of calendula. When the pain ceases, the cavity may be bathed with carbolic acid, and when comfort is entirely restored, the

cavity is carefully wiped out with small pieces of spunk. A quantity of the acetate of morphia, sufficient to cover the end of the small blade of a pen knife, is laid on a glass slab and incorporated into a paste with the oil of cloves or carbolic acid. This is then taken and placed into the concave side of a small lead disk, made from the sheet lead obtained from Chinese tea chests, and the disk so charged is carefully laid into the cavity over the exposed point, and retained in place with some adhesive wax, or temporary gutta percha stopping. Should the cavity be so shallow as to afford but little chance of the medicine remaining in place, it should be kept in place by wrapping a silk ligature a half dozen times around the tooth and thus rendering it secure. The little lead disks may be quickly made by punching pieces out of the sheet lead with a rubber dam punch, and laying these on a piece of soft white pine, with the ball end of the handle of an excavator the little disk is pressed upon. This causes it to sink into the soft wood, which gives it a cup like shape, and makes it an admirable vehicle for the application of morphia in the way we have described, or of arsenic for devitalizing, or as a nerve cap. Adhesive wax, for retaining such preparations, is made by melting together 7 parts of gum damar with 4 parts of pure yellow wax. Temporary gutta percha is made by melting together red sheet gutta percha and pure yellow wax in the same proportions. These preparations are much superior for retainiug medicines in a cavity of decay, to cotton steeped in sandarac varnish, as this material, being liquid, frequently finds its way over, under and on all parts of the medicines applied, and in this way either defeats or lessens their action.

After the application of morphia has been made, as we have indicated, the chances are that comfort will be restored to the patient, for twenty-four hours or more. An appointment should be made, however, for no longer an extended time than twenty-four hours.

While many operators claim a good measure of success with the operation of "Nerve Capping," we cannot say that it is one that has found good success with us. At one time we advocated it extensively, and practiced it whenever we thought there was a reasonable chance of success; but our experience has indicated that the operation often gave the patient long periods of pain and discomfort, while in others, if the pain from nerve capping was not present, the foreign body (the nerve caps) either caused the nerve to die and putresse within the tooth, causing abcess, or causing the discoloration of the tooth. We have lately, therefore, adopted what we consider "the shortest road to the end," and in the majority of cases devitalize the tooth. This

secures more comfort to the patient and, we think, equally as good, if not better, results.

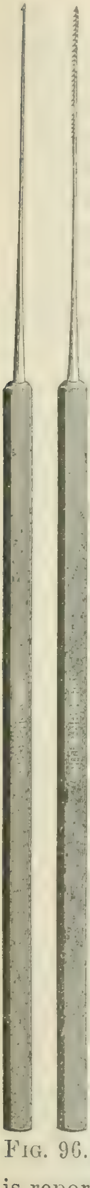


FIG. 96.

The most accepted manner of capping the pulp is as follows: The rubber dam is applied, the cavity shaped, and then flooded with creosote and oil of cloves. After these have soaked into the dentine a reasonable time, the surplus is wiped away with small pieces of spunk or bibulous paper. A little of the oxide of zinc is mixed with a drop of creosote into a paste, and this is filled into the concave surface of one of the small lead disks of which we have spoken. This is then applied over the point of exposure very carefully and without pressure. Some phosphate of zinc filling material is then mixed quite thin and applied into the cavity over the nerve cap. This is permitted to set hard before it is disturbed, when it may be dressed into shape, to conform to the contour of the tooth. The case should be dismissed for six months or a year, after which time a portion of the phosphate filling may be scraped away, attachments or retaining pits drilled into it and the tooth filled with gold or amalgam.

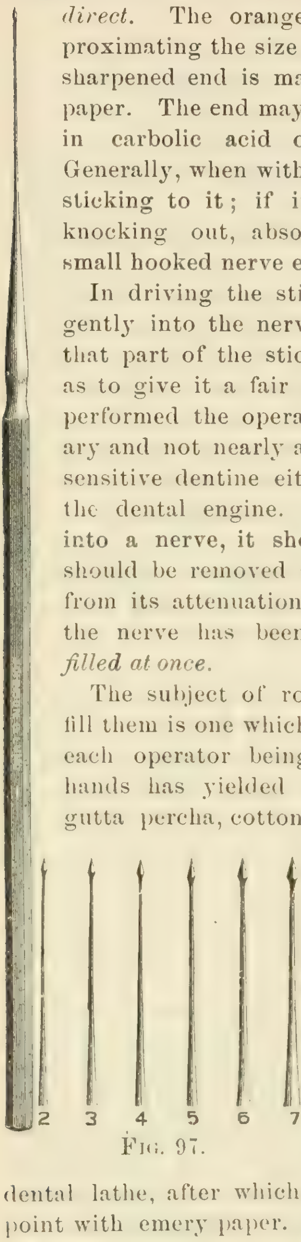
Should it be determined to devitalize, the rubber dam is applied, and the arsenical application made, and the medicine retained within one of the small lead disks, and secured in place either with adhesive wax or temporary gutta percha filling. We do not hesitate to let the devitalizer remain in contact with the pulp for a week, although twenty-four or forty-eight hours is the time most generally advised. At the end of a week the pulp will generally be found entirely dead. The devitalizing agent which has yielded the greatest satisfaction in our hands is the preparation of arsenic known as "Baldock's Improved Nerve Destroying Paste." We have had but very few cases of after pains, such as are ordinarily caused by the action of arsenic to the pulp, with this material.

After a week's action the nerve may be almost painlessly removed. Where this cannot be done with barbed nerve extractor, like Fig. 96, it may be done in the 6 upper front teeth, the 2d bicuspid, in the palatal root of the upper molar and in the lower cuspids and bicuspids, with an orange wood stick sharpened to an attenuated point and driven suddenly and quickly into the nerve canals of these teeth. The operation is reported to us as being less painful, because of its suddenness or quickness, than with the nerve extractors. To make use of this

manner of removing the nerve, the access to the nerve canal *must be direct.* The orange wood stick is sharpened to a size approximating the size of the nerve to be "knocked out." The sharpened end is made perfectly smooth with a piece of sandpaper. The end may be permitted to soak for a few moments in carbolic acid or an ethereal solution of iodoform. Generally, when withdrawing the stick, the nerve comes away sticking to it; if it do not, it can be removed, after the knocking out, absolutely without pain, with a barbed or small hooked nerve extractor, like Fig. 96.

In driving the stick into the root the end should be passed gently into the nerve canal, and the operator should look at that part of the stick which he is to strike with the mallet, so as to give it a fair and certain blow. All for whom we have performed the operation report that the pain is but momentary and not nearly as severe or unbearable as the cutting of sensitive dentine either with an excavator or with a bur in the dental engine. In withdrawing the stick thus driven into a nerve, it should not be twisted or rotated, but it should be removed *with a direct pull.* If rotated, the stick, from its attenuation, is apt to be broken off in the root. If the nerve has been devitalized, the root or roots may be *filled at once.*

The subject of root filling and the materials with which to fill them is one which probable will never be definitely settled, each operator being wedded to that material which in his hands has yielded the best results. Oxy-chloride of zinc, gutta percha, cotton, gold wire, lead, and copper canal points all have their advocates. Of one thing it is certain, the approach to the root canal *must be direct*, and the canal should be enlarged with canal reamers, Fig. 97. When the nerve canal is very small, as they are in the buccal roots of the upper molars—they should be first located. This is done with very fine hair like probes, which are easily made of piano wire. The end can be ground down to a moderately fine point on a corundum wheel in the dental lathe, after which it can be dressed down to a very fine point with emery paper. The temper of the steel wire *should not be drawn*, but the grinding and sand papering should be done with the



2 3 4 5 6 7

Fig. 97.

steel still tempered. The canal probe should not be made with a very long attenuated point, as shown in Fig. 98 A, because in this form the point is so slender that it is of little service to find the root canal, or indeed for any use. It should have a form preferably like Fig. 98 B. The point of this is equally as fine as the other A, yet the attenuation begins only about one inch from the end. This gives the probe an abundant stiffness, while it is sufficiently fine to enter into the canal, and even to pass through the apical foramina.

We will therefore say nothing as to the selection of the material to be used as the root filling. To open into the roots, instruments such as are shown in Fig. 99 should be secured into a universal socket or engine bit holder (see Fig. 100), and the jagged edges at the entrance of the root canal gradually made smooth. When this is accomplished, the instruments shown at Fig. 97 should be used. It is preferable to begin by using the *largest* of these instruments first, and then each successive size smaller, until a fair, clear, easy entrance and access to the root canals is thus secured. By beginning with the small size instruments first, there is more danger of breaking off the reamer in the root. When the root or roots are thus prepared, they may be filled at once with any material the operator prefers for this work, *provided the nerve has been devitalized.* But should the case be one of putrescent pulp or alveolar abscess, the septic matter infesting the root canals must be first entirely gotten rid of by proper antiseptic treatment before the root filling is performed. The filling of root canals is precisely the same in both cases; that is, whether the nerve has been devitalized, or whether the roots have been rendered aseptic by proper antiseptic treatment. The treatment of root canals.

FIG. 98.

FIG. 99.

when these are diseased from alveolar abcess, is first to open freely into the root in the manner we have described. It will be found much less laborious to make this opening by first applying the rubber dam, and then making the proper approach. In this way the burs and reamers will not be clogged, as they would be if done without the dryness that is secured by the rubber dam After the canal is cleaned out and properly enlarged with the nerve canal reamers

(Fig. 97), the probe (B Fig. 98) should be used and the points should be passed through the apical foramen. The proper antiseptic medicines should now be used on a fine probe, on which a few shreds of cotton are wound, with a pumping motion so as to force the medicine through the apical foramen. If the apical foramen be free, and there should be an external fistula, the cotton with which the probe is armed will act like a piston and the medicine will be forced through the root and along the tract of the abscess until it issues like froth or in little bubbles at the mouth of the external fistula. The medicines most generally used for this purpose are carbolic acid, creosote, eucaliptus oil, thymol, hydronapthol, bichloride of mercury, etherial solution of iodoform and per oxide hydrogen. If a free purging of the medicines can be made through the root canal, and along the tract of the abscess, a cure is generally effected, and the external fistula will gradually close by healthy granulations. In putrescent pulp, or in what is termed blind abscess—that is where there is no external fistula—the treatment is ordinarily more protracted. In these cases, after the root canals are well opened and treated with any of the medicines above enumerated, a small pellet of cotton is passed *lightly* as far up into the root as may be, and the lower part of the canal sealed. The patient is dismissed. If on the return of the patient the cotton is *free from any stain or discoloration, and free from the least trace of the odor of putrescence,* the root or roots may be filled, but should there be the least stain or the least odor, the treatment should be renewed and continued at subsequent sittings until the roots are rendered perfectly aseptic, inodorous and healthy.

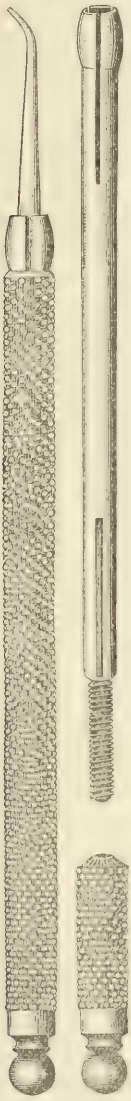


FIG. 100.

We have said that the first procedure in these cases of diseased teeth should be the application of the rubber dam. This may or may not be done, according to the locality of the tooth, or according to the case. If the diseased tooth be in the upper jaw, and there be an external fistula, it might be better to postpone the application of the dam until the first treatment is begun, for by so doing, should the medicines find egress through the external fistula, it is better seen than if the dam be applied while this pumping is carried on. Besides, the mouth of the external fistula, as well as the

tract of the abscess, are sometimes clogged, and this will prevent the medicines from passing through, in which case they can be freed by

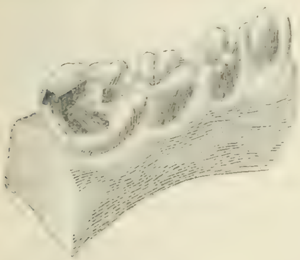


Fig. 101.

the introduction of an abscess probe, or by a fine probe wrapped on the end with cotton. The principal clogging, however, is generally at the apical foramen, and this should be made perfectly free, by letting the probe pass freely through it, when, generally, there will be no trouble about forcing the medicine through the root and out at the external fistula. When there is external fistula, or in the case of a lower molar, such as is shown at Fig. 101, it will be first necessary to grind away all the weakened parts of the tooth, as shown, with small

Fig. 102.

corundum points, such as are illustrated at Fig. 102. The roots are then gradually enlarged, and then treated with some of the medicines enumerated. It is always preferable to make the entrance either through the crown surface or through the mesio-masticating surface, as the root canals can be more directly approached from these surfaces than they can from the bucco-mas: or disto mas: surfaces. Indeed, if the decay has not consumed too much of the tooth from the disto mas: surface, it would be preferable to fill that part of the tooth, without any regard to the nerve complication, and then open into the nerve chamber

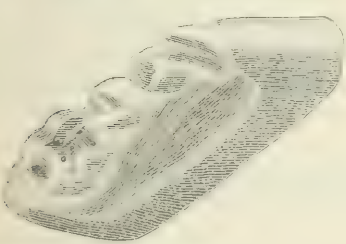


Fig. 103.

and root canals through the mesio-mas surface as shown by Fig. 103.

It will be seen that the distal cavity runs through into the mesio-masticating cavity. This should be filled without any reference to the forward cavity—while through the mesio-masticating cavity, the roots and root canals may be easily approached and treated. If this were not done the tooth would have to be cut through from distal to mesial surfaces, leaving the buccal and lingual walls standing, which would be an unnecessary weakening of the of the tooth. Many cases of this kind were formerly done, and after the necessary treatment of the roots affected, the tooth or rather the

remains of the crown was filled with gold or amalgam ; but experience showed that these would not last, for after the necessary preparations of these standing walls, and the most laborious and exhaustive filling with gold, the walls gave way, and the golden monument remained as a sign of "the glories of old." For it must always be borne in mind that the *tooth is the foundation filling*, and not the filling that gives strength to the crown. It is true that now, with the use of the phosphate filling materiels, these cases can be *very materially strengthened*, after which a portion of this may be cut away and gold packed all over it, which not only very greatly lessens the labor, but also improves the condition of the case. A large number of cases such as these (molars and bicuspeds) are now used for *crowning*, which operation is less laborious to the dentist, and infinitely more serviceable to the patient. When we meet with an incisor decayed on its proximal surface, where the territory of decay has not invaded much tooth substance, yet has been of such a penetrating nature as to have reached the nerve, it is better to operate in this case, as was advised for the lower molar (Fig. 103). The mesial cavity, as shown in Fig. 104 A, should be filled first, without reference to the nerve complication, after which the nerve cavity or root canal can be approached, as shown in Fig. 104 B, treated and filled more thoroughly, on account of the more direct approach, all with much less labor and more satisfactorily. To cut away the tooth from the mesial cavity until it met or joined with the palatal cavity, would give more work, weaken the tooth more, and not be attended with any advantage whatever.

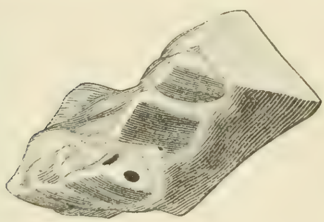


FIG. 104 A.

FIG. 104 B.

In Fig. 104 C is shown the same case, the right central incisor. Decay has consumed so much of the tooth that it has involved a large part of its labial surface as well as its palatal, as shown by Fig. 104 B. There are many persons who have a great aversion to artificial teeth, and who yet have a dislike to a display of gold in their teeth. Of the two evils they prefer the latter. This case would call for an extensive contour filling. The nerve

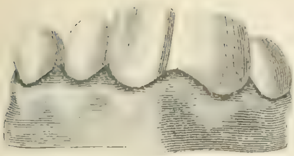


FIG. 104 C.

complication would be treated first through the palatal approach. This being done, and the apical foramen sealed, a piece of gold wire is fastened into the root, with some phosphate cement, and permitted to protrude therefrom, as shown in Fig. 104 D, so as to afford strength to the gold that is to be built around it. in contouring the case. On the other hand many persons, sooner than have a large display of gold, such as a case of this kind necessitates, would have the tooth crowned.

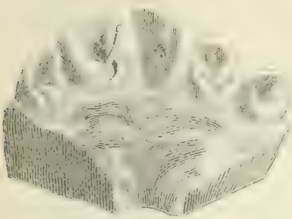


FIG. 104 D.

The contouring of a case of this kind, after being done for some years, it will be found that from the exposed corner of the gold, there is frequently a chipping on wearing, which makes the job unsightly to one who looks at it, and perhaps worries the patient by its roughness. To replace such a filling entirely, in the effort to repair such a damage, is no small job, either in the matter of strain on the operator or endurance on the patient, to say nothing of the expense incident thereto. It has been recommended to roughen the gold, after the application of the rubber dam, and to drill small retaining pits in different directions into the filling, and to add new gold from this new starting point. This has been done successfully, but Dr. I. Wilson Moore gives his experience in such cases as follows. He first applies the rubber dam and then wipes off the tooth and filling well, doing this with a little absolute alcohol and then with chloroform. He then takes a small probe and winds on the end of it a small ball of cotton, no larger than

FIG. 105.

a bird shot, as shown in Fig. 105, and dips this in alcohol. It is then set on fire, and after the flame is under control it is held against the contour filling until it becomes uncomfortably hot for the patient. This is continued two or three times until the gold is in a measure annealed. The point of repair is then roughened with a file or scratched deeply with an excavator, and then the new gold is added.

The union is said to be so perfect that the one cannot be separated from the other by the roughest kind of handling.

To return to cases of lower molars where it is necessary to open freely into the nerve chamber and roots. We have said that it is preferable to make the approach from the mesio-masticating surface. This applies as a general rule, yet we find cases where both the distal and mesial surfaces of lower molars are intact, while decay has penetrated to the pulp from the entire *buccal surface*. The first procedure in such a case, if it be one requiring devitalization, is the application of the nerve paste. The manner of doing this has already been set forth. The next will be the removal of all the disorganized tissue with excavators such as are shown in Fig. 106. After this the borders of the cavity are cut with small corundum points, used in the dental engine, and the outer margins of the cavity made smooth and sufficiently large as to enter readily into the nerve chamber and root canals. The rubber dam may now be applied and the tooth made perfectly dry. Large cavity burs used in the dental engine may now be used to cut away the floor of the cavity and make an entrance into the nerve chamber, blowing away the debris, made by the bur, from time to time with the chip blower. The form of the nerve chamber should not be cut or altered if possible. Search is made for the root canals with a probe, such as is shown at B Fig. 98. The dead nerve is removed with barbed (or hooked) nerve extractors. The root canals are reamed out with nerve canal reamers (Fig. 97) of a size commensurate with the size of the root, not using any of these instruments of a size that might be likely to perforate the side of the root. All debris should be blown out or removed as you proceed, so that it will not clog or choke the apical foramen. This is more particularly important when treating a case of alveolar abscess or putrescent pulp.

Fig. 106.

Fig. 107.

In treating a case such as we have described, it is our custom to drop, from a pipet, a drop of any of the medicines used for the treatment of putrescent pulp (per oxide hydrogen) into the cavity, and work this down into each root canal

with a probe. Such working will often result in changing the color of the medicine from its clear limpid hue to a murky, dark, blackish shade. This is then absorbed away, and more applied, and the working of the probe in the roots continued, until the color of the medicine is unchanged. After this treatment, the root canals may be lightly sealed and the case postponed for future treatment or filling. Fig. 167 represents a case such as we have described.

[FIFTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

Q. Is the pulp of a tooth susceptible to morbid impressions?

A. Yes.

Q. What circumstances give rise to these impressions?

A. The difference of temperament, bodily habit, the constitutional health, the condition of the tissues of the tooth, &c.

Q. Are these conditions always liable to produce these impressions?

A. No Some one or other of these causes might produce the most violent inflammation, in one case, which would be productive of scarcely any discomfort in another.

Q. What do you understand by hyperæsthesia?

A. It is an excessive state of irritability.

Q. Is hyperæsthesia dependent on any organic change of the condition of the tissues of the tooth?

A. It may exist independently of any organic change, either in the pulp, dentine or enamel.

Q. What is the most frequent cause of this irritability?

A. Caries. And the pulp takes on the most marked condition of irritability, even before decay has decomposed sufficient of the dentine to impair the relation between the two.

Q. May any other cause than caries produce such results?

A. Yes. Impaired digestion and a disordered condition of bodily functions will frequently produce the same effect.

Q. What external agents frequently cause an irritability of the pulp?

A. The impressions of heat and cold, or acids, conveyed either through a metallic filling, partially or greatly decomposed dentine, or even through sound dentine which has been deprived of its enamel covering, will frequently cause severe pain.

Q. What should be done in cases of pain induced by the irritation of the pulp?

A. The cause that produced the irritation should be removed. If from acids, by the use of alkaline washes. If from cold or heat conveyed through the medium of metallic fillings, these should be removed and replaced by others of a non-conducting nature.

Q. Will such treatments produce favorable results?

A. Generally, if done before an inflammation of the pulp takes place.

Q. What treatment is adopted in cases of excessive sensibility of the dentine, where this tissue has been deprived of its enamel?

A. The application of nitrate of silver to the exposed surface, or, when the surface is difficult of approach, by dipping a silver wire in nitric acid and applying this to the surface, by using the necessary precautions in the use of these agents, and by the application of salt to the surface to neutralize the nitrate thus applied. When applied to the necks of the teeth, a coating of collodion to the gum with a camel's-hair pencil is a proper precaution.

Q. What does the pulp of a tooth look like?

A. In a healthy state it is a grayish-white color, not unlike a piece of moistened cat-gut or fiddle-string, and the capillaries are invisible to the naked eye; but when in an active state of inflammation the capillaries may be distinctly seen, and the pulp then is of a bright red color.

Q. When inflammation, with its accompanying suppuration, sets in, how long does it take to run its course?

A. The time is various. Sometimes in three and often as long as ten days.

Q. Why should the inflammation of the pulp give such intense pain?

A. Because the pulp is enclosed by unyielding walls, which render expansion impossible, and as the capillaries become expanded with blood, they press upon the nerve filaments, causing the most intense pain.

Q. Does inflammation confine itself only to carious teeth?

A. No. Sound teeth may be attacked as well as decayed ones; but the severity of the pain is determined by the condition of the tooth, the state of the general health, &c.

Q. When this inflammation tends to the formation of alveolar abscess, can anything be done to give relief?

A. Yes. A vent-hole drilled through the crown of the tooth, or at its neck, or through one of its roots when these are exposed by

the recession of the gum, for the escape of the pus, will give almost instant relief.

Q. What are some of the causes of inflammation of the pulp?

A. A severe blow; the sudden changes of temperature, as of heat and cold, conveyed through the tissues of the tooth, or through a metallic filling; the pressure of a filling on the pulp over a very thin lamina of dentine; the very sudden contact of the teeth against each other, as in biting threads or the cracking of ice or hard substances; the contact of irritating agents, &c.

Q. Has the inflammation of the pulp any other tendencies besides those of pain in the tooth?

A. Yes. Sometimes quite severe constitutional tendencies supervene—such as headache, earache, constipation of the bowels, furred tongue, dryness of the skin, quick and full pulse, &c.; but these disturbances most generally come from some conditions of the general health.

Q. What should be done if the inflammation be produced by exposure of the nerve?

A. After the cavity is cleansed of all particles of food or irritating matter, it should be syringed out with tepid water, and then dried. Applications may now be made of tincture aconite, or the crystals of carbolic acid, (rendered fluid with a little chloroform), may be applied, or a few crystals of muriate of cocaine, moistened with water, to which add a drop of carbolic acid and a drop of glycerine, so as to make these combine with the cocaine solution, may be applied with benefit, and gently sealed into the cavity. But if the irritation be the result of the pressure of a filling, this should be removed, and treatment such as has been advised, or any other palliative treatment used to suppress or abort the inflammation, when, after quiet has been entirely restored, either by these means or by the application of leeches, the administration of saline cathartics, or by blood-letting, &c. If these measures should not prevent suppuration, they will, at least, prevent the whole pulp from becoming involved. But should the pain still continue, despite the treatments proposed, an entrance should be made into the nerve-chamber and a vent given to the suppurating pulp, in order to prevent, if possible, the disorganization from affecting the alveolo-dental-membrane.

Q. Is such a state of things brought about immediately after the filling of a tooth such as you have instanced?

A. Not always. The irritation or inflammation may not occur for several weeks, or even months, after such filling is inserted, or it may be still longer delayed, and may only be brought on by a condition

of the general health, when the pulp will take on this irritability and end in suppuration and alveolar abscess.

Q. Are there any symptoms or indications which lead us to suppose that inflammation of this kind is about to take place?

A. When there is an uneasiness about the tooth, a disposition to take the tooth between the thumb and finger, a sense of temporary relief when the teeth are pressed against each other, when hot or cold food, taken into the mouth, gives pain, a gnawing and gradually increasing discomfort or pain is felt—these are some of the indications that point to inflammation and ultimate suppuration.

Q. May the pulp of a tooth suppurate without the formation of alveolar abscess?

A. Yes. The pulp is liable to a superficial suppuration on its surface. In such cases, layer after layer of the pulp becomes disorganized from the points of exposure. Deep pockets are formed in the pulp from the effect of this suppurative process, until the whole organ becomes a mass of pus filled with micio-organisms. This continues until the whole pulp is destroyed up to the end of the root.

Q. What are the causes of these suppurative pulps?

A. Blows, or any mechanical violence, the moving of young teeth too quickly in regulating, too rapid separation of the teeth for gaining room to fill, thermal shock conveyed through metallic fillings, exposure of the pulp from decay, etc.

Q. Does a dead pulp within the tooth invariably cause pain?

A. No. The tooth may remain quiet for weeks, months, or even years, but without apparent cause or reason, the action of the atmosphere, the sleeping in a draught, a cold, wet or damp feet, may bring about violent pain, the effect of suppuration. In view of this it has become a question whether dead teeth that are quiet should not be let alone as long as they are comfortable. As all dead teeth are *liable* to cause alveolar abscess, the treatment for relief in all such cases is to make a vent for the exit of the pus.

Q. Would you destroy the pulp only for the immediate relief of pain?

A. No. The destruction of the pulp should only be resorted to after all the means known to us have been tried to relieve the congestion or irritation.

Q. Why should you attach so much importance to the keeping of the nerve alive, instead of giving immediate relief by some devitalizing agent?

A. Because the pulp is the source of nourishment of the tooth, and supplies it with blood; and as a man is a better man having his arms

and legs intact, so is a tooth a better tooth being properly supplied with the vital fluid. We find likewise an answer to this in the fact that no surgeon would ruthlessly resort to the amputation of a limb without making every effort to save the member, so also should the dentist make every effort to save the tooth with a living healthy pulp before resorting to devitalization.

Q. How is a nerve or pulp destroyed?

A. There is no one fixed method about this: some holding in favor of immediate extirpation by actual cautery, others by the application of a devitalizing agent.

Q. What agent is most generally used?

A. Arsenic.

Q. How is this applied?

A. To the actually exposed pulp.

Q. Suppose a patient to present undergoing extreme torture, would you apply arsenic to the pulp?

A. No. I should use palliative treatment first. I would remove all impacted food and loose dentine from the cavity. I would then syringe out the cavity gently with tepid water, not permitting the jet to be forced on the nerve. I would then use a little chloroform and tinct. aconite in the cavity, with an effort to allay the pain. If, after a critical examination, I should find that the pain was not due to actual exposure, I would place in the cavity a paste made up of the acetate of morphia and the oil of cloves, sealing this in with a small pellet of cotton, and afterwards with some temporary stopping, such as adhesive wax or wax and gutta percha. If complete quiet was not restored within an hour, I would then remove the dressing, apply the rubber dam (should the cavity be on the proximate surface of the tooth), dry the cavity thoroughly, and expose the nerve. When the blood from the exposure would be arrested by the application of chloroform, callendula phenol sodiqui, or any styptic, I would apply to the cavity several obtundents, so as first to restore quiet. I say several obtundents, because sometimes one obtundent will act benignly in one case, where the same will have no effect in another. When quiet is restored, I should place directly on the exposed point a drop of nerve paste the size of a pin's head. I would keep this in place by placing a small disk of lead over it, made convex by pressing a ball burnisher on it. I would keep all in place by the use of some adhesive wax or temporary gutta percha filling, made of wax and gutta percha.

Q. How long is it necessary to keep the devitalizing agent in contact with the nerve?

A Opinions and practice in this matter vary. The general procedure seems to be from twenty-four to forty-eight hours. The former time if no pain is experienced after the application, the latter time if pain is felt after the application.

Q. May the nerve be removed painlessly then?

A. Some contend that it can, but the general procedure is to remove the arsenical application after the time specified, and let the case remain for a week or more, it being contended that in this way there is a partial sloughing of the pulp, whereby it may be removed from the tooth painlessly.

Q. How is the nerve removed from the tooth?

A. A fair clear opening is made into the nerve chamber by means of round or oval burs in the dental engine, when barbed nerve broaches are introduced as far into the root canal as possible, when the instrument is given a twist with the fingers, causing the barbs to engage the organ, when it is withdrawn from the tooth.

Q. Is there any particular way of introducing the barbed broach into the root canal for the purpose of extracting the nerve?

A. Yes. The point is introduced next the wall of the root canal, with the barbs pointing in the same direction, and in this position it is gradually forced as far into the root as possible.

Q. Is the operation always painless?

A. Some contend that it is, but many aver that patients complain of considerable pain.

Q. How can you account for this pain when the nerve has been killed?

A. It is true that the arsenic may have devitalized a large part of the pulp, but the whole organ may not have succumbed to the action of the destroyer. In this way a portion of the pulp near the apex of the root might be still alive, and the forcing of the dead organ against the live part, in the introduction of the barbed broach, accounts for the pain felt.

Q. Is this pain extreme or intolerable?

A. Some patients report it so, and will not submit to the extraction of the nerve.

Q. What are you to do in such cases?

A. It is necessary to remove the nerve from the root canal, otherwise the putrefaction which would ensue from it would be a cause of disease, and of considerable pain, as it would result, most probably, in an alveolar abscess. Nevertheless, dead nerves have been left in root canals and no after trouble ensued, yet it is not considered proper practice to do this. When the pain is of so severe a character

as to prevent the removal of the dead nerve with barbed or hooked nerve broaches, a resort is made to accomplish its removal by what is termed *knocking out the pulp.*

Q. How is this done?

A. A piece of orange wood twig, or tough cane, is whittled, filed, and sand-papered down to a fine attenuated point, approximating in size to the nerve to be removed. The end of this is soaked for a few moments in carbolic acid, when it is introduced into the root canal as far as it will go without causing pain. A sudden well directed blow with a hand mallet on the twig drives it into the nerve, and in this way, although the nerve is not removed painlessly, the pain is of such short duration that patients often prefer its being removed in this way to the protracted way of fishing it out with hooks or barbed broaches.

Q. Can this operation be performed indiscriminately for all patients and teeth?

A. No. The temperament of the patient should be taken into consideration, and the tooth also.

Q. What teeth are best operated on in this way?

A. The upper incisors and the cuspids; the first superior bicuspid, although this tooth requires two blows, one for each root: the second superior bicuspids; the palatal root of the first and second superior molars; the lower cuspids and bicuspids.

THE PRACTICAL PLACE.

A Local Anæsthetic.

We are sorry to find that there is a growing tendency to make use of nostrums put on the market, about which little or nothing is known of their composition or action. In America, dentists have been flooded with "Local Anæsthetics," warranted to do anything and everything under the sun. Of course, the majority of all such things are mere trash, and sometimes worse, for they may contain ingredients which are positively injurious. In this country there seems to be some sort of demand for secret drugs in the treatment of aching or pulpless teeth, as if we had not already a perfect legion of remedies of which we know their specific action. The demand must exist or the supply would not be advertised. What we protest against is the employment of any drug of which we cannot trace its action, and the encouragement of merely empirical and ignorant treatment. Perhaps no drug of the kind referred to has wormed its way into medical favor with greater persistency than chlorodyne.

Everyone pretended to know exactly what it contained, and therefore had the less hesitation in using it. And lo! now either it or its ghost appears in the official British Pharmacopœa, under the high-sounding title of "tinctura chloroformi et morphinæ." The following is the formula, long enough to please the most fastidious:

Chloroform	1 fluid ounce.
Ether	2 fluid drachms.
Rectified Spirit	1 fluid ounce.
Hydrochlorate of Morphine	8 grains.
Diluted Hydrocyanic Acid	½ fluid ounce.
Oil of Peppermint	4 minims.
Liquid Extract of Liquorice	1 fluid ounce.
Treacle	1 fluid ounce.
Syrup	A sufficiency.

—*The Dental Record.*

Dr. E. M. Todd, in *The Dental Record*, gives the following as a local anæsthetic, which he has tried and found very efficient:

℞.	Cocaine Mur	gr. 50.
	Acid Boracic	gr. ii.
	Liq. Hyd. Bichlor	M. 40.
	Aquæ Destal ad	M. 250.

M. To be applied locally by means of pledgets of cotton, held tightly to the gum on each side of the tooth to be extracted.

A curious "effect" was related a few weeks back in *The Hospital* as following an injection of cocaine. A professor had it injected in his jaw, and immediately became unconscious; artificial respiration was resorted to, and after six hours consciousness returned. During those six hours—while he was apparently lifeless—he heard all that was going on round him. Ever since the incident, the unfortunate savant has been haunted by the remembrance of a case of drowning, where he tried artificial respiration for two hours and then gave in. What if his doctors had given in at the end of two hours?

Creosote.

The addition of three or four drops of creosote to a pint of ink effectually prevents it from becoming thick.—*The Record.*

AFTER WORKING WITH PLASTER it is often very difficult to get the hands free of it and into a pleasant state. A teaspoonful or so of moist brown sugar rubbed well on to the hands, while they are wet, accomplishes this very quickly.

HALF GRAIN OF COFFEE GROUNDS, either steeped or fresh, in the vulcanizer, destroys the sulphurous smell so disagreeable, if there is a slight leak where the operating room and laboratory communicate. Coffee grounds burned in the laboratory are a good deodorent in case of necessity.

A STRONG BASE-PLATE MATERIAL for use in setting up sets to try in, can be made by soaking "Paper Fibre Lint" in Stearine just at the melting point. It is important not to have the Stearine too hot, as otherwise too much of the fat runs out of the paper when it is taken out to cool. This should be cut to the required size, warmed and pressed on the model, and then the teeth fixed to this with wax.

DR. FLINT is quoted as saying: "I have never known a dyspeptic to recover vigorous health who undertook to live after a strictly regulated diet, and I have never known an instance of a healthy person living according to a strictly dietetic system who did not become a dyspeptic."—*Scientific American.*

A WEAK galvanic current, which will sometimes cure a toothache, may be generated by placing a silver coin on one side of the gum and a piece of zinc on the other. Rinsing the mouth with acidulated water will increase the effect.—*Exchange.*

IF YOU want a lovely odor in your rooms, break off branches of the Norway spruce and arrange them in a large jug well filled with water. In a few days tender, pale green branches feather out soft and cool to the touch, and giving the delightful health-giving odor.

THE SWEDISH CURE FOR DRUNKENNESS.

The habitual drunkard in Norway or Sweden renders himself liable to imprisonment for his love of strong drink, and during his incarceration he is required to submit to a plan of treatment for the cure of his failing which is said to produce marvelous results. The plan consists in making the delinquent subsist entirely on bread and wine.

The bread is steeped in a bowl of wine for an hour or more before the meal is served. The first day the habitual toper takes his food in this shape without repugnance; the second day he finds it less agreeable to his palate; finally he positively loathes the sight of it. Experience shows that a period of from eight to ten days of this regimen is generally more than sufficient to make a man evince the greatest aversion to anything in the shape of wine. Many men after their incarceration become total abstainers.

Nickel Steel.

It has been recently discovered that strong as steel is, it can be made yet stronger by an alloy of three to five per cent. of nickel. This means that in the future we can have larger bridges, higher towers and lighter machinery than ever. Ship-owners, and the passengers as well, have had no small cause of anxiety in the susceptibility to magnetism of the iron so largely used in ship building. It would seem that the chief source of error in compasses may soon be removed, as it is found that a little manganese alloyed with iron produces a metal with scarcely any capacity at all for magnetism. Both iron and steel are now secured against another old foe of theirs, rust, by an ingenious process which coats them with a magnetic oxide of iron.

From a bushel of corn a distiller gets four gallons of whisky, which retails at $16. The government gets $3.60, the farmer who raised the corn gets 40 cents, the railroad gets $1, the manufacturer gets $4, the retailer gets $7, and the consumer gets drunk.

The other day a gentleman came to Dr. Musgrove, a well-known dentist, suffering from a front tooth. Although it showed no decay, it had to be pulled. Around the root was found firmly coiled a little rubber band such as are used to fasten papers. Then the gentleman remembered the explanation of his sleepless nights and long period of agony. A month or more ago his little daughter was playing on his knees and having a rubber band she playfully fastened it on his tooth. It had been allowed to remain without his knowing, and worked down to the root, causing the loss of the tooth.—*Philadelphia Times.*

A Lecture Overheard in a Restaurant.

"Oh, I'm exhausted with this shopping," exclaimed a well-dressed

woman, as she dropped into a seat in a restaurant that caters to the tastes of shoppers. "What shall we order?" she added to her companion. "I'm too tired to eat anything heavy; let's have an ice, a chocolate eclaire and some soda-water. I must eat something, or I shall look 40 when Charlie meets us at the matinee."

"My dear child," said her elder companion, "let me give you a word of advice. The chief aim of every sensible woman to-day is to keep healthy. With health the preservation of good looks is a comparatively easy task; without it, a useless struggle. Your body is exhausted now by shopping, and you have no appetite. If you want something that will nourish your flagging powers, without overloading your stomach, order a glass of milk, and order it hot—as hot as you can sip it. You may not like it while you are drinking it, but after you have once experienced the soothing effect it soon has on your nerves and the added strength it seems almost immediately to impart, you will not be deterred from using it because of its peculiar taste.

"Now, don't swallow it so fast and in such big gulps," she added, as her companion was drinking the hot milk which had been ordered, just about as one would toss off a glass of soda-water before the effervescence was all over. "Sip it slowly. Take four minutes at least to finish that glassful, and don't take more than a good tea spoonful at a sip. My husband is a doctor, you know, my dear, and I have had to listen to a good many dissertations on the chyme and the chyle and the gastric juice and all the other troublesome and unpleasant things which go to aid the disagreeable, but indispensable, function of digestion; for I was once a fearfully fast eater myself, but he cured me of it, and I am going to give you a little lecture now.

"When that milk goes into your stomach it is instantly curdled. If you drink a large quantity at once it is curdled into one big mass, on the outside of which only the juices of the stomach can work. If you drink it in little sips, each little sip is curdled up by itself, and the whole glassful finally finds itself in a loose lump made up of little lumps, through, around and among which the stomach's juices may percolate and dissolve the whole speedily and simultaneously.

"Many people who like milk, and know its value as a strength-giver, think they cannot use it because it gives them indigestion. Most of them could use it freely if they would only drink it in the way I have described, or if they would, better still, drink it hot. Hot milk seems to lose a good deal of its density; you would almost think it had been watered, and it also seems to lose much of its

sweetness, which is cloying to some appetites. If the poor only knew and appreciated the value of milk taken in this way, I am sure there would not be so much beer drinking among them. There are thousands of hard-working scrubwomen, washwomen, factory girls, and even shop girls, in this city, who drink beer with their meals because it gives a little stimulant to their tired bodies, and don't understand that it is only like applying a whip to a weary horse, instead of giving him oats. If they only knew, they would find in this simple draught as much real strength as in a barrel of beer.

"In fact, hot food generally is coming more and more in favor among sensible women who are wide awake as to the effect on their beauty of good health. Ices and indigestion go hand in hand, cold drinks and dyspepsia lie down together, and warm bouillon is getting to be as common as tea at receptions, at home and five-o'clock teas." —*New York Tribune.*

Liquid Glue.—J. R., Reading, Pa.: We are sorry you do not find satisfactory the formulas recently published. It is the acid which is relied on to keep the glue fluid, and the article you used may not have been strong enough. The following is an older formula:

Glue	8 ozs.
Water	8 ozs.
Nitric Acid	$2\frac{1}{2}$ ozs.

Dissolve the glue in the water in the customary way on a water-bath, and then add the acid in small quantities at a time, avoiding the fumes which arise.

Another recipe is:

Glue	1 oz.
Cider vinegar	2 ozs.

Dissolve with the aid of heat. This is, of course, a primitive form of the recipe in which acetic acid is employed.

An Alleged Cure for Hydrophobia.

Dr Arapad Bokai, professor at the University of Klausenburg, claims to have compounded a solution which completely neutralizes the poison introduced into the system by the bite of a mad dog. This solution consists of chlorine water, salt brine, sulphurous acid, permanganate of potassium, and eucalyptus oil.

Liquid for Bronzing.

A fluid for bronzing paper, glass, leather, etc., is prepared as fol-

lows (*Pharm. Zeitung*): Diamond fuchsine 10 parts, and methyl-violet 5 parts, are dissolved with the aid of heat in 95 per cent alcohol. To the solution 5 parts of benzoic acid is added, and the whole is boiled from five to ten minutes, until its green color has changed to a lustrous golden bronze. This is very brilliant, durable and adherent, is easily laid on with a brush, and dries in a few minutes.

Snuff for Colds.

Dr. C. H. Stowell, of Washington, recommends the following in place of solution of cocaine:

Sodii bicarb	ij grs.
Magnesiæ carb. (levis)	iij grs.
Menthol	j grs.
Cocaine hydrochlor	iv grs.
Sacch. lactis	iss.dr.

M. Sig.—Use as snuff.

The most marked relief, says the *Chemist and Druggist*, will follow the use of this powder, and a few applications will do much to abort the catarrhal attack Its effects are immediate, highly agreeable to the patient, and continuous for a number of hours.

A discovery of vital importance has just been made by Dr. Chamberland, Pasteur's assistant, and Drs. Mennier and Cadiac, which proves that essence of cinnamon, when sprinkled in the room of a typhoid fever patient, kills the bacteria within twelve hours, and prevents the disease from spreading.

"Incompatibility" of Gold.—Dr. Bonwill writes me that a physician informs him that a case is reported in his Medical Society of a lady who had to have all her gold fillings—quite a number—removed, to restore her health. "She had been suffering continually from the dynamic effect of the gold." What nonsense!

But this case is no more preposterous than that of a homœopathic physician, who came to me to have some teeth filled. I had filled a few previously with gold. Said he: "Doctor, I shall have to have the rest of my teeth filled with some other metal than gold. I see that metal is incompatible with my constitution. You know, gold is our remedy for insanity; this shows, it is its cause. Most people are not susceptible to its influence by merely having it in their mouth, but, I see, I am. I am conffdent it would make me crazy."—*Items of Interest.*

Mr G. W. Adams writes to *Items of Interest:* This is a handy thing to have in the laboratory. To make it, gather up all the small pieces of Castile soap, and shave them up thin and fine. Put them into an iron pan with just enough soft water to cover them, and place on the stove or over your gas spider, and heat gently, stirring slowly, until the soap is all dissolved and the solution becomes uniform and of one homogeneous mass. Care must be taken not to have much heat, or the soap will swell rapidly and "boil over."

Before you commence the boiling operation, select a broad-top bottle and fit a brush nicely into the cork for future use. As soon as the soap is thoroughly dissolved, pour it into the bottle while hot.

This soap solution should stand on the work-bench within easy reach. Coat your model with it before immersing in cold water, when about to make a trial plate of gutta percha. It prevents the hot plate from sticking to the cast and marring the face. When the case is inverted in the lower half of the flask, and properly trimmed and ready for the upper half, coat the model, plate and wax—the whole of it except the *teeth*—before setting on the upper rim. This is somewhat antagonistic to the teachings of Professor Wildman, whose instructions were to "use soap solution only on naked plaster." But experience is my dictator. After packing your case, soap the face of the model again, just immediately bringing the parts together to prevent adhesion, if you should need to separate them again to either add more rubber or to remove some. The soap solution can be used for coating the impression before pouring the plaster to make a cast, if you wish colored plaster. But I prefer to use white plaster, and varnish my impression with shellac, to make a "color line" of demarkation. The coating of the inside of the flask with soap solution, before using, will prevent the plaster from adhering so tenaciously.

[There used to be a patent on this process thirty odd years ago; we paid $25 for the privilege of using it.—*Ed. Items.*]

Chloralamid: A New Hypnotic.

This new preparation, introduced by Von Mering, is an addition product derived from chloral anhydride and formamide. It forms colorless crystals, which are soluble in nine parts of water, and in one and a half parts of 96 per cent. alcohol. Its taste is mild, slightly bitter. The effect on the circulation and blood-pressure is very slight, while the comparison of its blood-pressure curve with that of chloral indicates how very little the former is altered com-

pared with the latter. Kny, of Strassburg, has recently tried it in thirty-one cases, the single dose varying from 20 to 60 grains. The cases best suited for its exhibition are those of simple sleeplessness where chloral is of service. In severe delirium it has little effect. It acts well in melancholia, alcoholism, neurasthenia, and in cases of insomnia from bodily ailment—phthisis, heart-disease, &c. It can be given safely in the sleeplessness of old people, but for the relief of pain, as in neuralgia, it is of little use. The hypnotic action of chloralamid is not so powerful as that of chloral hydrate—30 grains of the latter acting as efficiently as 45 of the former. Its effects likewise come on somewhat later, about twenty to forty minutes after administration, on an average half an hour, those of chloral beginning within fifteen minutes. The sleep, however, induced by the new drug is deeper and more refreshing, its duration varying according to the case from six to ten hours. It is very free from after-effects, the patient awakening in the morning with a clear head. The general feeling of heaviness, with the disagreeable taste in the mouth so common after choral, is absent here. Chloralamid has several other advantages over the older drug. Thus there is no injurious influence on the gastric tract, nor is there any irritative action on the mucous membranes, which is often seen after chloral. It can, therefore, be taken by patients both in powder and in wine without any difficulty. But its most important advantage over chloral is the absence of injurious effects on the circulation. In two cases of valvular disease, doses of 45 to 60 grains were given without any bad result on the heart, while sleep of six to eight hours was produced. Finally, there was an absence of the appearances of congestion and unpleasant after effects on awakening.

It is *superior* to sulphonal, being more soluble, and entirely free from the dangerous prostration and disagreeable after effects so common to sulphonal.—*Therapeu. Monatshefte.*

Uses for Coffee.

It is asserted by men of high professional ability that when the system needs a stimulant, nothing equals a cup of fresh coffee. Those who desire to rescue the drunkard from his cups will find no better substitute for spirits than strong new-made coffee, without milk or sugar. Two ounces of coffee, or one-eighth of a pound, to one pint of boiling water, makes a first class beverage, but the water must be boiling, not merely hot. Bitterness comes from boiling too long. If the coffee required for breakfast be put in a granitized kettle over

night, and a pint of cold water poured over it, it can be heated to just the boiling point, and then set back to prevent further ebullition, when it will be found that while the strength is extracted, its delicate aroma is preserved. As our country consumes nearly ten pounds of coffee per capita, it is a pity not to have it made in the best manner. It is asserted by those who have tried it that malaria and epidemics are avoided by those who drink a cup of hot coffee before venturing into the morning air. Burned on hot coals, it is a disinfectant for a sick-room. By some of our best physicians it is considered a specific in typhoid fever.—*The Epicure.*

PRECIOUS METALS—MANY ARE VERY MUCH MORE VALUABLE THAN GOLD.

Probably ninety-nine persons in a hundred if asked to name the most precious metals would mention gold first, platinum second and silver third. A few might add nickel and aluminum to the list. Let us see how near the truth they would be, taking as the basis of comparison the following from the St. Louis *Globe-Democrat:* Gold is worth about $240 per pound, troy; platinum, $130, and silver about $12. Nickel would be quoted at about 60 cents, and pure aluminum $8 to $9 to the troy pound. Now compare these prices with those of the rarer and less well known of the metals. To take them in alphabetical order, barium sells for $975 per pound, when it is sold at all, and calcium is worth $1,800 a pound.

Cerium is a shade higher—its cost is $160 an ounce, or $1,920 a pound. These begin to look like fabulous prices, but they do not reach the highest point; chromium brings $200, cobalt falls to about half the price of silver, while didymium is the same price as cerium, and erbium $10 cheaper on the ounce than calcium, or just $1,680 per pound. If the wealth of the Vanderbilts be not over-stated, it amounts to nearly $200,000,000. With this sum they could purchase 312 tons of gold and have something left over, but they couldn't buy two tons of gallium, that rare metal being worth $3,250 an ounce. With this metal the highest price is reached, and it may well be called the rarest and most precious of metals.

Glucinum is worth $250 per ounce; indium, $158; iridium, $658 a pound; lanthanium, $175, and lithium, $160 per ounce. Niobium costs $128 per ounce; asmium, palladium, platinum, potassium and rhodium bring respectively $640, $400, $130, $32 and $512 per pound. Strontium costs $128 an ounce; tantaum, $144; telurium, $9; thorium, $272; vanadium, $320; yttrium, $144, and zirconium, $250

an ounce. Thus we see that the commonly received opinion as to what are the most precious metals is quite erroneous.—*Houston Post.*

[The price of platinum noted in above article was previous to the advance. It is now about on a par with gold.—Ed.]

The Production of Pumice Stone.

As a matter of fact, none of the white pumice stone in general use is obtained from active volcanoes. It is true, Vesuvius has ejected pumice stone, for at the time when Pompeii was destroyed, large quantities fell over the doomed city, but that pumice appears to have been only of diminutive size, and is gray in color, and of the same inferior character as that found to the north of Naples. It is also probable that volcanoes situated in the southern seas emit pumice, for accounts are published of vessels sailing through quantities stretching for miles on the surface of the water. This, presumably, is similar to that taken from the sea near the Italian shores. It is small in size, and in the form of pebbles, having been rounded by the action of the water.

We are indebted for our supply of stone to actual deposits of the article discovered in one or two quarters of the globe, the best of which is at present to be found in the island of Lipari, situate in the Tyrrhenian Sea. The island is scarcely visited by any but Italians engaged in trading in its productions, such as currants, carpers, wine and pumice. It is mountainous, and consists of tufts and lavas and of highly siliceous volcanic products. The district where the stone is found is called Campo Bianco or Monto Petalo (1,500 feet above the level of the sea). The effect produced by the first sight of the pumice deposit is curious, for after riding a considerable distance, partly along precipitous paths, sufficiently dangerous to be interesting, and partly through vineyards and over grassy plains, one almost suddenly comes on a seemingly snow-clad narrow valley inclosed by hills, also quite white, and the whole glaringly bright on a sunny day, such as can be experienced in this southern latitude. Into these hills workmen are ceaselessly digging burrows, working within by candle light. In their excavations they come across many lumps of pumice stone, which are placed in baskets, subsequently being conveyed along the valleys to the seashore, where small boats are loaded and sailed to the seaport near by, where the stone is sorted, packed and shipped to distant parts, either via Messina or Leghorn.—*Scientific American.*

Oxyphosphate Fillings.—There are a few points about oxyphosphate fillings worthy of note. We have all noticed that what is left on the mixing dish is usually more adherent and harder than what we put into a cavity. Both these facts depend on circumstances which are usually absent in the mouth. To make a dense filling it should be allowed to set thoroughly before the dam is removed, and moisture should be excluded for at least twenty-four hours. This may be accomplished by using a coating of chlora-percha over the finished surface of the filling. If the dam is left on until this varnish has hardened by the evaporation of the chloroform, it will not wear off for a week, and I have known it to last two months. Such fillings are comparatively permanent. Where we wish to utilize the sticking or cement quality of this material, the best result is obtained by first lightly coating the surfaces with the liquid. This is why the material is so adherent to the slab. I have thus cemented regulating fixtures to teeth, and at the completion of the work found it troublesome to detach the cement from the enamel after the fixture has been forced off.—*Dr. Ottolengui, Inter. Jour.*

Directions for Working Aluminum.

The following directions are given by the Scovill Mfg. Co., Waterbury, Conn.:

A cubic inch of pure aluminum weighs approximately one-tenth of a pound avoirdupois, being about one-fourth the weight of an equal bulk of pure silver.

Pure aluminum can be rolled, drawn, spun, stamped, engraved burnished, polished and soldered to the same extent and by the same processes as used on brass, with the following exceptions:

Annealing:—A very low and even temperature should be maintained in the muffle. Aluminum melts at about 1,300 deg. Fahrenheit—a very dark red. The inexperienced, therefore, cannot judge the proper annealing temperature by the eye alone, without danger of fusing the metal. When the metal has been heated enough to char the end of a pine stick, thus leaving a black mark in the wake of the stick as it is drawn across the metal, it is sufficiently annealed. The metal should then be withdrawn from the furnace and allowed to cool slowly in the air. For some work, such as stamping and drawing, it is sometimes better not to heat the metal so hot as to leave a dead black mark with the stick, but just enough to shown a dark brown mark instead. Very thin sheets or wire can be annealed sufficiently for some purposes in boiling water.

Dipping and Pickling.—Remove the grease and dirt by dipping in benzine. To whiten aluminum, leaving on the surface a beautiful white matte, dip first in a strong, hot solution of potash, then rinse in water, and dip in undiluted nitric acid, 42 deg. Then wash in water, and dry as usual in hot sawdust

Polishing —Use fine white polishing composition or rouge, and a rag buff.

Burnishing.—Use a bloodstone or steel burnisher. For hand burnishing use either kerosene oil or a solution composed of two tablespoonfuls of ground borax dissolved in about a quart of hot water, with a few drops of ammonia added.

For lathe work the burnisher should wear upon the finger of his left hand a piece of Canton flannel, keeping it soaked with kerosene, and bringing it in contact with the metal, supplying a constant lubricant.

Very fine effects can be produced by first burnishing or polishing the metal and then stamping it in polished dies, showing unpolished figures in relief.

Scratch Brushing.—Polish or burnish the surface, and then use a fine steel scratch brush.

Soldering.—A special solder is necessary. Cleanse the metal from grease and dirt. Use for soldering fluid Venetian turpentine Place the solder upon the metal with the Venetian turpentine, and heat gently in a blowpipe until the solder is melted. It will then be found to have fixed itself firmly to the aluminum.

Sand Castings.—Use open but very fine sand, and bake the mould. Large feeding gates should be provided, and the mould should be well vented. Pour the metal quickly, at a temperature but little above the melting point. Use either Taylor's or Dixon's plumbago crucibles.

Milling, Planing, and Turning.—Use plenty of oil to prevent the clogging of the tool and to make it cut smooth.

Securing Immediate Suction in Dentures.

Some years ago, somewhere in dental literature, I came across a suggestion for securing immediate suction in a new dental plate or a newly repaired one. It has been of so much use to me that I herewith submit it, and advise its trial. The plate is moistened, and then simply sprinkled with fine powder of gum tragacanth. The plate is then pressed in place, and no matter how good or bad a fit, it will hold firmly for a day under almost any use or abuse. The advantage of this will be apparent to any one; for the first half hour

or few minutes after a plate is put in for the first time makes or mars the reputation of the dentist, for the time being, in the estimation of the inexperienced patient, whose efforts to "suck up" a plate, if not immediately successful, are at once discontinued, the plate is taken out, and the invariable remark is, "It don't fit."

A patient will bring a rickety, ill-fitting plate, and after being without it the few hours necessary to repair it, will insist that the plate fitted perfectly before it was confidingly submitted to our care, but now it feels as though it had been made for another party. A thin coating of tragacanth will even up all irregularities, soothe the wounded sensibilities of the patient, and prevent the plate wounding the sensitive membrane of the mouth.

Tragacanth is a white gum like arabic, but has special advantages for this use, as it swells when wet by the fluids of the mouth, becomes sticky and of the consistency of jelly, but does not dissolve or wash out for hours. It should be kept in a salt or flour shaker with fine perforations in the top, and should be sprinkled on the surface of the plate, shaking off all the free powder after a moment. Having no odor and little taste, it is in no way objectionable. It might be put up in suitable perforated boxes and flavored with wintergreen, or otherwise made more elegant, mysterious, and costly. If the dentist is of the opinion that time and use will improve the general adaptation of the plate, a small box of tragacanth should be presented to the patient, with directions for use when there is a varying atmospheric pressure which may possibly affect the suction of the plate! Its use will also obviate the necessity for labored explanations as to the cause of certain plates only resting on certain prominences of the maxillary and certain other tender places on the mucous membrane. It will also be a relief to the patient, for the mental effort necessary to the intellectual digestion of these scientific dissertations, and to retain a credulous expression of countenance, is often evidently as painful as the sharp edges of the plate.—*L. C. Bryan*, *Dental Cosmos.*

Tin.

Tin, which every one knows, but which few, except men of science and metallurgists, are acquainted with, is one of the most precious and interesting metals. After gold and silver, it is intrinsically the most precious of those in use. It is nearly of the same color and almost as bright as silver, but has less resistance and is less valuable. When warmed by friction, it has a pronounced odor and taste. When it is bent, the derangement of the crystals of which its mass is formed

causes it, without any fracture taking place, to emit a peculiar sound which metallurgists call its cry, and by means of which an expert can nearly determine its degree of purity. The places where tin is produced are few, scattered sparsely over the surface of the globe, and it disguises itself under the form of a blackish mineral which, to the profane eye, gives no sign of the treasure that is within it.

One of the richest as well as the most ancient tin mining districts is in the Malay Peninsula, the Golden Chersonesus of the ancients. The name of the province, Perak, signifies silver, but it is peculiarly the province of tin. The use of tin dates from extreme antiquity. Homer mentions it as *kassiteros*, in the descriptions of the arms of his heroes. Herodotus speaks of the British Islands as the *Kassiterides.* The Phenicians obtained the tin which they furnished to the ancient world chiefly from those islands, but partly also from Gaul and the Iberian Peninsula. Before the Phenicians and the Greeks, however, the Chaldeans knew this metal under the name of *kastira.* The most ancient document in which a mention of it has been found is probably a hymn to the fire, which M. Oppert has translated from the Acadian language, a tongue the knowledge of which has been recently revived from cuneiform documents. Tin was designated in them, five thousand years ago, as *anaku.*

The Biblical text in the book of Numbers in which Moses names tin in the enumeration of the metals is therefore comparatively modern, for it is of fifteen hundred years later date than the hymn to the fire. Even more definite than these texts is an Egyptian statuette in bronze (an alloy of tin) of the age of the pyramids, or 3,000 years B. C. Let us return to our own age, and see what is the present annual production of tin. In a recent book on the Industries of the Netherlands, M. De Ramaix gives as the production of the Dutch East Indies, 10,000 tons, of Cornwall, 8,000 tons, and of Australia, 7,000 tons, in all, 25,000 tons. These figures show that the English mines have fallen off since the days of the Phenicians, when Cornwall was the principal center of production. They have been left behind by the Dutch East Indies, and will soon be overtaken by Australia, if the number, 7,000 tons, given as the present production, is not exaggerated.

Saxony and Bohemia, which still figure in the cyclopedias as sources of tin, are not mentioned in M. De Ramaix's estimate. A graver omission is that of the Malaccan mines, which I have mentioned as the most ancient, and also perhaps the most productive. According to Mr. Patrick Doyle's Tin Mining in Larut (London, 1879), the Malay states of the Malaccan Peninsula exported to Pe-

nang in 1877, in round numbers, 2,500 tons of tin, and the Siamese states of the same country 7,000 tons, making 9,500 tons in all. From personal information, I estimate the exportation from the single Malay state of Perak, in 1881, at 6,139 tons. The production of the Peninsula having grown steadily since 1876, I believe I can assert that it now takes the lead among tin-producing countries, and that the world's total present annual production of this metal is not less than 45,000 tons. Yet this production is hardly sufficient to supply the needs of existing industry, for the price of tin before the crash in copper, by which it was also affected, had reached the high figure of $800 a ton.—*Popular Science Monthly.*

A Valuable Toothache Remedy.—For violent toothache dentists may depend upon the following combination for its marvelous and instantaneous effects. It is a remedy of unrivaled power and absolutely reliable. "Break a hypodermic tablet of $\frac{1}{4}$ grain morphine sulphate, et utrophine sulphate, 1-150 grain in four parts; dissolve one part in ten drops of *warm*, *well*, *spring* or *river* water thoroughly. A perfect solution of the partial tablet having been made, it is drawn up into the syringe and the contents thereof slowly and cautiously injected into the hard gums surrounding the aching tooth. Several applications may be made until all of the contents of the syringe are injected. No danger of bad after-effects can result from the dose used, as it represents but 1-16 grain of morphine sulphate and 1-600 grain of the powerful alkaloid derived from belladonna, 'atropine sulphate.' *Sulphate* of atropine is freely soluble in water, the pure atropine is not. Tablets of the above formula may be purchased of John Wyeth & Brother, of Philadelphia. They will prove an invaluable addition to the armamentarium of every progressive dentist" Always prepare a *fresh solution for every case.—Dr. Bowne, Amer. Jour.*

One of the most profitable talks was that given by Professor Mayr. It is always a pleasure to listen to this gentleman. In these days when peroxide of hydrogen is so generally used, it is important for us to have a simple means of testing its purity. Professor Mayr gave the following:

Potass. Iodide, grs. iii; Starch, gr. i; Aqua, oz. ss.

Mix and boil. Then add a small quantity of soda bicarb. Saturate a piece of blotting-paper with this and lay aside for use when wanted. This will not deteriorate for a long time. A few drops of peroxide on this will show a dark-blue spot if good, violet if poor, and no color at all if worthless. More of such talks as professor Mayr gave both last year and this, before this Society, would increase the interest of dentists in their society work.—*Dental Mirror.*

THE

Dental Office and Laboratory.

FOURTH SERIES.

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OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S

(Continued from page 171, No. 6, Vol. 4.)

When a bicuspid is decayed, such as is shown in Fig. 108, the best thing to do with it is to put a crown on the roots. An all-gold crown is the most serviceable operation, but if the patient object to the display of gold, it may be inserted with a porcelain facing. If, however, the patient is aversed to artificial teeth, inserted even in the best manner, such a case may be filled. It would be folly to fill such a tooth, *only* with gold or amalgam, for it would not be very long before one or the other of the cusps (perhaps both) would break away. The roots of such a tooth having been treated and filled, as already described, the crown is filled with phosphate cement. When this hardens, grooves and pits are made into it, after it has been dressed away, about $\frac{1}{32}$ of an inch from *all the margins* of the cavity, as shown in Fig. 108. The gold is then introduced into one of the pits, and more and more added, bridging from one pit to the other, until a superstructure of gold is made on the cement foundation.

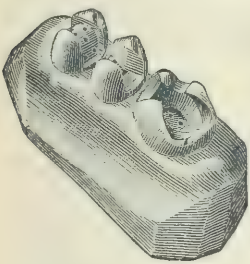

FIG. 108.

In the cut Fig. 108, the *second bicuspid* is prepared for the reception of the phosphate of zinc filling. The *first* bicuspid represents how this material should be cut away from the margins or borders of the remains of the tooth, and so prepared with grooves and retaining pits as to permit of the introduction of gold into the tooth.

When the palatal cusp of a bicuspid is broken off, leaving the buccal cusp standing, a serviceable operation may be made by making a filling that would save the remains, and make the tooth like a cuspid. Fig. 109. In doing this the procedure is very much as was described for filling of Fig. 108. The roots are treated and filled, and then the remains of the crown filled with phosphate of zinc, and to this the superstructure of gold added.

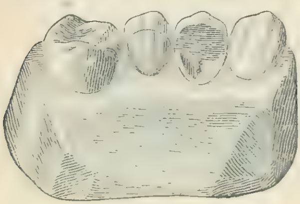

FIG. 109.

In Fig. 109, the first bicuspid represents the case where the palatal cusp has broken off, and the second bicuspid represents such a tooth filled in the form of a cuspid.

When the buccal cusp of a bicuspid is broken off by excessive decay and the palatal cusp still remains, as is shown in Fig. 110, to remedy this defect a porcelain facing may be added. This may be done as follows: An impression of the prepared root and remains of the crown is taken, and from it a model made. A small, short porcelain plate cuspid is ground to fit the model. This is backed with gold. When the tooth is fitted and backed, it is held in place by a piece of wax and a matrix of plaster cast over it, so as to hold it in position, as shown in Fig. 110-B. A piece of 22-karat gold plate, No. 30 gauge, and $\frac{1}{16}$ of an inch wide is bent and fitted, as shown at C in the supplementary cut of the same figure. When this is done, the matrix is removed and the tooth taken from it. The tooth is then warmed and a film of adhesive wax flowed over the backing. The little ends of the narrow piece of gold, C, are likewise coated with adhesive wax. The matrix, with the tooth in it, is replaced on the model. The small gold band, C, is placed around the palatal cusps, and the band and tooth are united by placing a heated instrument against the ends of the band, so as to melt the adhesive wax which had been previously placed on both. When this is cold, the tooth and band are carefully lifted off the model, when they are invested and soldered, as shown at D. It is

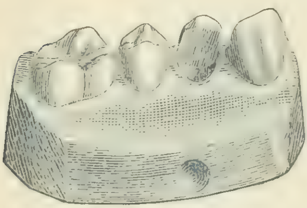

FIG 110.

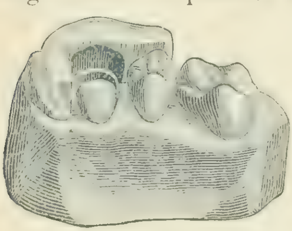

FIG. 110-B.

inserted by filling the root part of the tooth, as well as the palatal cusp, with phos. of zinc cement. The band is also coated with cement when it is placed in position, as shown at G, Fig. 110, and held thus until the cement hardens.

The fitting of this band around the palatal cusp, as well as the bending of the ends of it, so they will fit well against the backing of the porcelain tooth, requires delicate adjustment. The same case, or a similar case, may be accomplished by backing the tooth, after fitting it to the model as before, using platinum instead of gold for the backing. A platinum pin is fitted into one root of the bicuspid, and this pin is made sufficiently long to extend above the cutting edge of the porcelain tooth to admit of its being seized and withdrawn from the root canal without disturbing the relations of the pin and tooth when the two are held together with adhesive wax. This pin, pivot-wire or dowel (whichever we may call it), will ordinarily just touch the backing on the mineral tooth. The tooth and dowel, after being united with adhesive wax, are withdrawn by seizing the protruding end of the pin (See Fig. 110, E or F), when it is invested and soldered. A small piece of platinum plate, about $\frac{1}{16}$ of an inch wide and a trifle longer, is soldered to the pin opposite the backing, as shown at X, Fig. 110 F. This may be done by holding it in place next the dowel with a small iron wire clamp, when it is invested (clamp and all) a second time and soldered. The object of this piece of plate is to bind or engage the filling material that is used, so as to hold the artificial tooth to the remains of the natural crown.

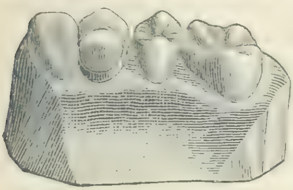

Fig. 110-G.

Fig. 110, E or F.

The tooth is inserted by placing the pin, previously coated with a little cement, into the root canal and filling the interspace either with amalgam or with phosphate of zinc cement, preferably the latter. The manipulation we have described is shown by the supplementary cuts E and F, Fig. 110—E representing the full back view of the porcelain tooth, showing the piece of plate soldered to the dowel, and F a side view of the same, the piece of plate soldered to the dowel being indicated at X. Of course, before the tooth is inserted the protruding end of the dowel is filed off and finished.

In the articles which we have written on "Operative Dentistry," we think we have included all the cases of gold filling in the localities in which decay most generally occurs. Decay sometimes, though

rarely, occurs on the palatal surfaces of the upper molars and on the lingual surfaces of the lower; but these cases are of rare occurrence. The filling of these teeth in these localities must be managed in the same manner as on the buccal surfaces, though the approach to them is attended with more difficulty. While they *can* be filled with gold, there are other materials which serve a better purpose than gold, and whose manipulation is attended with less difficulty to the operator and as good, if not better, results to the patient.

We have said nothing, so far, about the use of amalgam, gutta percha, or the chloride or phosphate of zinc.

Amalgam.

The preparation of a cavity of decay for an amalgam filling should be the same as for gold, except that for this material retaining pits are never needed. Amalgam answers well on the masticating surfaces of the molars and bicuspids of either jaw, as well as for cavities on the buccal surfaces of the molars. Where decay has so corroded a tooth as to consume both the proximate and masticating surfaces, amalgam also serves a good purpose in such localities.

When decay has been so extensive as to consume all or nearly all of the dentine, leaving only the shell of enamel remaining, it is not considered good practice to fill such a tooth with amalgam alone. Such cases are better done by lining this shell with phosphate of zinc, when, after it hardens, it may be trimmed into shape and filled with amalgam.

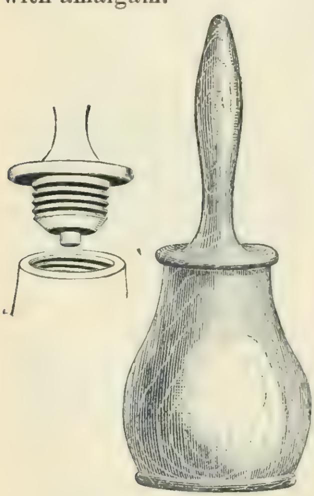

Fig. 111.

Mixing Amalgam.

To mix amalgam, a globule of mercury a little larger than the cavity to be filled may be dropped into the palm of the left hand from a mercury holder, Fig. 111, and the amalgam poured on. The filings should be worked with the finger of the right hand into the mercury until there is an amalgamation of the two. It should then be thrown into a small wedgewood mortar and rubbed up *with force* until it is made into a smooth, velvety mass. It should then be placed in a piece of chamois skin and twisted, so as to remove the superabundant mercury, and finally it should be squeezed with force between the jaws of a pair of large, flat nose pliers, so as to still farther remove the excess of

mercury. If the mercury clings to the chamois skin in small globules in the latter manipulation, the pliers holding the mass should be rapped on the work table, so as to make these globules let go their adhesion. It is important that the filings of amalgam be well mixed with *a sufficient quantity of mercury*, otherwise good results will not be obtained. It is better to press out the excess of mercury than to attempt to use the amalgamated mass dry or powdery. In this form it is not only difficult to introduce it into the cavity, but the filling, made in this way, has more the characteristics of a lot of filings than of an amalgamated mass, and will result into a granular filling. On the other hand, it is important not to err on the other extreme and have the filings so soggy with mercury as to make it almost a semi-fluid mass. When it is twisted, squeezed and pressed as we have indicated, it should be laid on the bracket table and cut up in small pieces. All the instruments necessary to fill the cavity should be laid on the bracket table ready at hand. A piece of amalgam that will readily enter the cavity is taken with the foil-tweezers and placed within. This should be crushed down with a small ball burnisher or amalgam plugger, using a rubbing and rolling motion of the instrument, so as to make the mercury in the mass come to the surface. Another and another small piece is added, one at a time, using the same character of force or manipulation until the cavity is filled. Should there be any fissures leading from the main cavity, a smaller plugger will be necessary to force or pack the amalgam into these places. When the cavity is full, if the mercury appear around the edges, it should be wiped or brushed away with a piece of spunk, or the excess may be removed by applying to it a piece of tin foil held by the tweezers, which will readily remove the excess.

The above manipulation applies to all crown cavities or to proximate cavities having circumscribed walls. Where the cavity is compound, involving the buco-masticating surface, the mesio-masticating or the disto-masticating surface, a matrix will be indicated, and will prove quite an aid to the operator. Where a tooth adjoins the one under treatment, the matrices designed by Dr. Miller or Dr. Woodward serve an excellent purpose; but where a tooth is wanting against which to wedge the matrix, those designed by Dr. Guilford or Dr. Brunton should be used. The Brophy matrices are excellent for such use also, but are better indicated for filling with gold. If used for filling with amalgam, it frequently happens that in the attempt to remove this matrix (unless the amalgam has set quite hard) the filling will be destroyed in so doing.

It would be futile to attempt to give the names of the different alloys (amalgams) that are put on the market for sale or to recommend any one in particular as being the best.

Bridging with Amalgam.

We have seen cases where the extensive decay in the proximate surfaces of two teeth were bridged over with amalgam. The rubber dam is applied and a quick-setting amalgam used ; the dam serving to keep the amalgam from the gum tissue. Bridging of this kind may be done with gutta-percha, but not with amalgam ; for the reason, we believe, the softer gutta-percha accommodates itself to the motion or gumphosis articulation of the teeth, which the rigid character of the amalgam refuses to do.

Thus, in chewing or biting more pressure may be brought on one tooth than on the other, which results in the loosening of such fillings by the breaking away of portions of the tooth and thus permitting decay to start around the filling, or inducing this by the movement of the filling allowing minute particles of food to find their way between the tooth and filling.

Copper Amalgam.

This material has had extensive use of late, and is deservedly popular in certain cases. When properly made it is very smooth and velvety, and when properly heated it sets with reasonable promptness. It may be used successfully in all desperate cases and in any of the back teeth, but particularly in *distal* cavities. It turns very black, but we are disposed to think that it does not blacken or discolor tooth tissue. It may be used in closer proximity to the pulp than any other metallic filling material from its lowthermalconducting property. Copper amalgam may be made in various ways, the simplest as follows : In a glass jar of about a quart capacity, having a flat bottom, about a half inch of quicksilver is poured. A solution of blue-stone (sulphate of copper) is mixed, in any large bottle, by powdering the blue-stone (about three ounces to one gallon of water) and adding water to it. When dissolved, the jar containing the quicksilver is filled with the solution to within an inch of its mouth. A clean piece of sheet iron, such as is used to make stove pipes, wide enough to enter easily the mouth of the jar, and about one and a half inches shorter than the height of the jar, is punched on one end and a string passed through the hole. This piece of sheet iron is brightened by rubbing it on both surfaces with a piece of sand or emery paper. It is then washed clean and the same surfaces smoothed over with a rag dipped into a solution of sulphuric acid

and water, such as is used in the dental laboratory to dissolve the borax from gold or silver work. The sheet iron is then placed into the jar, letting one end of it rest on the quicksilver, and the string on the other end, used to keep it in an upright position. After a time the copper in the solution will precipitate itself against the iron and unite with the mercury. The amalgam thus formed may from time to time be scraped off the iron, when it falls and unites with the quicksilver in the bottom of the jar. The solution will, after two or three days, be exhausted of its copper, when it may be poured off and fresh solution added. A fresh piece of sheet iron, treated as has been described, will have to be introduced, from time to time, as the acid of the solution will eat this away. This adding of fresh solution is continued until the quicksilver is noticed to become thickened by the addition of copper. The solution is then poured off and the amalgamated mass passed into a wedgewood mortar, where it is washed by constant stirring and rubbing with the pestle until the water used for washing it is perfectly clear and no discoloration ensues from the most persistent rubbing with the pestle. The water is then drained off and the mass placed into a piece of chamois skin. Gathering up the ends of the skin, the mass is squeezed by twisting the skin with the fingers over a large basin, in order to save the exuding mercury. After it has been thus well squeezed the lump or mass is placed into a small, clean, round-bottom ladle and gently heated to drive out the water that was used in the washing. This heating will make it again quite plastic, when it may be placed into another clean, dry piece of chamois skin and again twisted and squeezed. It is again heated and squeezed until as much of the mercury as possible is removed from it, when it is made into little pills for use in the chair. When heating it in the round-bottom iron ladle it should be rubbed up with the pestle. In this way any dentist can make copper amalgam for his own use, but when making it for sale other means are used, principally by electricity, which it is needless here to mention.

[SIXTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

Q. What is that pain called, which is experienced in the preparation of a cavity of decay in a tooth prior to filling?

A. Sensitive Dentine.

Q. Does not this pain come from the exposure of the nerve?

A. Not always. A cavity of decay may be exquisitely sensitive though the nerve be not exposed.

Q. Where is this sensitiveness mostly found?

A. Where the union of the enamel and dentine occurs, or just beneath a lamina of decayed dentine.

Q. Is decayed dentine sensitive?

A. Not always. When it is so, it may be regarded as an abnormal condition; because decayed dentine is dead tissue, and dead tissue should have no sensation, hence the sensitiveness is abnormal or something out of the natural order of things.

Q. What is thought to be the cause of sensitive dentine?

A. The cutting, severing or stretching of the dental fibrillæ in the shaping of the cavity in the tooth.

Q. What treatment is proposed for it?

A. The application of chloride of zinc in the cavity and letting this remain for five or six minutes, is the most popular remedy.

Q. Is not the use of arsenic indicated for this purpose also?

A. Arsenic is used by some operators, but its use is strongly condemned on account of its absorption by the dentine and the most probable death of the pulps resulting from its use.

Q. But the chloride of zinc is likewise a most powerful escharotic, why should not the death of the nerve ensue likewise from its use?

A. Experience has proved that its action is unlike arsenical preparations, and that it has no deleterious effect on the pulp.

Q. It would appear that the use of so violent an agent would cause, rather that mitigate pain?

A. Its application does cause pain, but the pain is only of short duration, while it changes the condition of the dentine to such an extent as to make the pain which was before intolerable, readily borne.

Q. Is it necessary to make several applications before the cavity is thoroughly prepared?

A. Sometimes; but ordinarily one application will alter the condition of the sensitive dentine sufficiently to admit of the preparation of the cavity with only bearable pain.

Q. How is it applied?

A. It is sometimes applied in full strength in crystals, or it may be made into a paste with flour, or anhydrous sulphate of lime and this applied in the cavity. It should be applied directly to the sensitive spot and held against it for about five minutes to obtain its best results.

Q. Are the chloride of zinc and arsenic the only remedies used for this condition?

A. No. Tannic acid, creosote, nitrate of silver, carbolic acid, chromic acid, chloroform and other agents are used for this condition, as also dehydration by the use of warm air, or intense cold by the use of the rigoline spray.

Q. Are there any other means recommended for sensitive dentine?

A. The use of very sharp burrs and excavators is recommended, using these with a firm decided cut at the sensitive point, or giving a sweeping cut around the circumference of the cavity in a direction away from the pulp. When the access is easy, the rubbing a burnisher over the sensitive dentine will sometimes lessen the pain or destroy it entirely. The application of Electricity by means of a looped wire, or the "Dento-Electric Cautery" is also recommended.

Q. What is the inflammation of the investing membrane of the roots of the teeth termed?

A. The inflammation of this membrane is variously termed "Periodontitis," "Pericementitis," "Dental periostitis" and "Peridentitis."

Q. What is the nature of this membrane?

A. It is a very vascular membrane and highly susceptible to inflammation.

Q What is the cause of its inflammation?

A. A violent blow on the tooth may cause this membrane to inflame, or the biting of very hard substances; the most frequent cause, however, is from the death of the pulp induced by decay of the tooth.

Q. Where does this inflammation generally commence?

A. In the apical space, the place at the end of the root where the membrane is usually thicker.

Q. Why should the inflammation of this membrane cause such intense pain?

A. As it is surrounded by the bony socket of the tooth and confined therein, and being profusely supplied with nerves and blood-vessels it has no means of expansion when these vessels become engorged or congested with blood.

Q. Are there any varieties of this disease?

A. Yes. It partakes of an acute and chronic character.

Q. What are the symptoms of acute periostitis?

A. The first symptoms are feelings of uneasiness in the tooth affected. A desire to shake it by holding it between the thumb and finger, a feeling of fullness, and a disposition to press the teeth together—a feeling of relief being experienced as long as the pressure is kept up, but the pain or uneasiness returning when the pressure is removed.

Q. What symptoms follow these?

A. The uneasiness increases to pain of a dull heavy character. The affected tooth seems longer than its fellows, which is really the case, since by the engorgement of the membrane, this is thickened, which forces the tooth slightly out of its socket and causes this feeling of length or protrusion. If the jaws or teeth are suddenly brought together the action causes intense pain, to avoid which the sufferer keeps the teeth apart.

Q. What other indications, besides the above, point to the existence of periostitis?

A. The gums, which in health are of a pale rosy hue, assume a deep red, almost a purple color, over the affected tooth, and partake also of the congested condition of the peridental membrane.

Q. Is the pain continuous or spasmodic?

A. It is rather continuous; it may cease for a short time, yet it never ceases for any length of time.

Q. What is the result of this inflammation?

A. Suppuration ensues, and the culmination is an alveolar abscess. This assumes sometimes a very aggravated form, involving nearly if not all of the periosteum, causing the death of the tooth, and frequently erosion of the root and necrosis of the bony socket.

Q. What do you understand by Erosion?

A. It is an eating away of the part affected, caused either by a chemical, mechanical or morbid action of disease.

Q. Do we find these sequences general or are they peculiar?

A. Not general; but when the subject is of cachectic habit these aggravated conditions frequently follow.

Q. What do you mean by a Cachectic habit of the body?

A. It means a depraved or morbid condition of the general nutrition, such as when the subject is scrofulous, cancerous, or syphilistic.

Q. Is this disease readily diagnosed?

A. Yes. By pressure on the affected tooth. It is different from pulpitis, in that it is not generally affected by thermal changes.

Q. What is the difference between Acute and Chronic periodontitis?

A. Chronic periodontitis is but a modified form of the Acute and may consist only of a soreness of the tooth, and in slight annoyance, or may be accompanied with considerable congestion about the tooth, and a sensitiveness of a greater or lesser degree when the tooth is pressed upon.

Q. What is the cause of periodontitis?

A. It is generally the result of inflammation of the pulp of the tooth either from its being exposed or from the presence of irritating

substance, such as of a dead or decomposing pulp. It may be caused by the presence of salivary calculus, the injudicious use of arsenic or substances used to mitigate the pain of sensitive dentine. It is sometimes caused by the action of mercurial remedies, or from the loss of an antagonizing tooth, or from a violent blow, or from the too close proximity of a metallic filling next the pulp, or from overhanging portions of a filling on the proximate surfaces of the teeth. Besides these local causes, constitutional causes may induce it, such as a syphilitic taint, rheumatism, salivation by mercury, scrofula, etc.

Q. What is the treatment for this disease?

A. This will depend on the causes which produced it and the condition of the system. The first effort is the removal of all irritating matter from the cavity of decay and pulp chamber, after which counter irritants to the gums, free blood letting by the lancet, but preferably by leeches.

Q. What should be done on the first symptoms of the disease?

A. Ordinarily patients will postpone having any thing done until driven by severe pain to seek relief; but when the symptoms of inflammation are first felt it should receive immediate attention. If the pulp is dead, all debris should be removed from the pulp chamber, with nerve instruments and this syringed out with tepid water. The pulp cavity should then be thoroughly disinfected with iodoform, eucalyptus, iodine, carbolic acid, sanitas, etc. The root canal should be then loosely filled with cotton on which some antiseptic agent is soaked, and the outer cavity sealed, not tightly, but only sufficient to prevent the escape of the agent or the entrance of food. If pus is present the dressing should be frequently changed. When this treatment does not give relief counter irritation may be resorted to. The application of tincture aconite and iodine, in equal parts, is often effectual, or the application of a roasted raisin, fig or onion to the gum over the affected tooth. The application of cantharidal collodion, by means of a camel hair brush, being careful to protect the lips, when using this agent, will cause a blistering within an hour or two and result in relief. Hypodermic injections of morphia have also been resorted to in cases of intense pain. Saline cathartics administered with a view of relieving the congestion are sometimes effective. The bromide of potassium in doses of twenty-five grains, or this quantity combined with five drops of the tincture of veratrum virde, and repeated every four hours will often prove serviceable. A preparation known as *mercurius vivus*, the third decimal trituration, given in small doses two or three times a day, has been recommended by Prof. Chase for the relief of periostitis.

Q. What do you understand by " an Alveolar Abscess?"

A. An abscess within the socket to the tooth.

Q. Why do you not call it simply an abscess, instead of an Alveolar Abscess?

A. Because the collection of pus is within the alveolus or socket of the tooth, in the form of a little bag or sac adhering firmly to the root of the tooth.

Q. Does the abscess always form at the end of the root?

A. Not always. Frequently it occupies what is known as the "Apical space" which is a thickening of the peridental membrane around the end of the root, yet we find the abscess sometimes at the side of the root and sometimes occupying a position between the roots, as in the upper and lower molar teeth.

Q. What is the cause of Alveolar abscess?

A. It is the result of inflammation of the peridental membrane.

Q. Can you tell me how these abscesses are supposed to be formed?

A. The membrane covering the root of the tooth being the seat of the disease, plastic lymph is effused. This lymph is condensed into a sac which closely adheres to the extremity of the root, and as the disease progresses pus is formed within the sac. The accumulation of pus within the sac causes its distention, which exerts pressure on the bone, by which it is surrounded, making this absorb or melt away, when the pus finally finds egress on the gum, in what is popularly known as " a gum boil."

Q. Does this disease ever give rise to serious results?

A. Yes. Sometimes the accumulation of pus causes a separation of the periosteum from the bone of the alveolar cavity, and the septic matter being brought in contact with it might cause *necrosis* of that tissue, if it is not promptly discharged.

Q. Is this the only serious result that might ensue from an Alveolar abscess?

A. No. In some cases the sinus of the abscess may invade the duct of the salivary gland, and necessitate the operation for salivary fistula In cases of abscess resulting from an inferior third molar, the disease causes considerable inflammation of the tonsils, as also of the muscles of the cheek and neck, resulting in trismus.

Q. What do you mean by trismus?

A. It is a spasm of the muscles of mastication, commonly known as lockjaw.

Q. Do we find these results to occur with children in their temporary teeth?

A. No. Because the apical foramen in the temporary teeth is so

much larger than it is in the permanent teeth that the pus finds readier access through the former than through the latter; besides which, the bones of childhood are more vascular and consequently offer less resistance to the pressure of the accumulating pus in the cyst, than in adults.

Q. Where does the escape of pus generally take place?

A. Through the alveolus on the gum nearly opposite the end of the root.

To be continued.

BLEEDING AFTER EXTRACTION.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

Cases of this kind are always attended with a certain degree of solicitude. We had recently advised the extraction of three remaining teeth with the view of inserting a set of artificial substitutes. One of these teeth was the right upper second molar, from which the gum had receded so much that it seemed to be held in place only by the gum-tissue, there being no alveolus. It has been our experience that cases of this kind, when bleeding succeeds extraction, are the most difficult to control, as there is no socket wherein to pack styptics. Dr. Atkinson says that the cause of the bleeding, when it comes from the blood-vessels at the bottom of the socket, is due to the fact that the mouth of the blood-vessels is caught in the socket, and is thus unable to close on themselves. He recommends in such cases that the best thing to do is to take a burr and burr the end of the socket a little larger, so as to allow the sides of the open-mouthed vessels to be free from the wall, when they will contract and the hæmorrhage cease.

The case to which we have alluded bled from the second upper molar, which had no socket, as we before said, yet the bleeding was so profuse and persistent that the lady was in a fearfully weakened condition from the loss of blood. We had only sent her to have the teeth extracted about 10 o'clock in the morning, but by 8 o'clock at night a messenger came to report the condition of affairs, expressing great alarm at her condition.

We had that morning been reading the paper of Dr. W. L. Roberts "On the internal administration of tannic acid for hemorrhage after tooth extraction," so that we determined to give the remedy a trial. We weighed out *three grains of tannic acid*, and gave it to the messenger, with instructions to dissolve it in two-thirds of a tumbler of water, and to give the patient two teaspoonsful of the solution every

five minutes until she had taken three doses, after which to give the same quantity fifteen minutes apart, but if the bleeding ceased after the second or third administration to cease the medicine. The following morning we called to see the patient and found her still very weak and quite pale from the loss of blood. She told us that the bleeding ceased after the second dose of medicine, but that she thought she would die from excessive weakness.

The object of this paper is to call attention to this remedy. Dr. Roberts recommends that *three grains of tannic acid* be dissolved in *one-third of a tumbler of water*, and given in doses such as we have stated, but forgetting at the time whether he had stated one third or two-thirds of a tumbler of water, we told the messenger to dissolve the drug in two-thirds. In our case the administration proved equally as efficacious in the more homœopathic dose. This is the first and only case in which we have tried the remedy, but its happy termination will induce us to give it more extended trial and note its exhibition. We do not desire, in this article, to "take the wind out of Dr. Roberts' sails," but merely to call attention to his valuable suggestion and to bear testimony to its efficacy.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The seventh annual session of the National Association of Dental Faculties was held at Excelsior Springs, Mo., commencing Monday, August 4, 1890. T. S. Waters presiding.

The following colleges were represented :

Baltimore College of Dental Surgery, M. Whilldin Foster.
Boston Dental College, Wm. Barker.
Chicago College of Dental Surgery, Thurman W. Brophy.
Kansas City Dental College, J. D. Patterson.
Missouri Dental College, W. H. Eames.
Ohio College of Dental Surgery, H. A. Smith.
Pennsylvania College of Dental Surgery, C. N. Pierce.
University of California, Dental Department, C. L. Goddard.
University of Iowa, Dental Department, A. O. Hunt
University of Michigan, Dental Department, J. Taft.
University of Pennsylvania, Dental Department, James Truman.
Vanderbilt University, Dental Department, D. R. Stubblefield.
Louisville College of Dentistry, A. Wilkes Smith.
Indiana Dental College, J. R. Clayton.
Dental Department of Southern Medical College, L. D. Carpenter.
Dental Department of University of Tennessee, R. B. Lees.

University of Maryland, Dental Department, John C. Uhler.

Columbian University, Dental Department, H. B. Noble.

On motion, Dr. J. D. Patterson, Kansas City, was elected secretary *pro tem*.

The following resolution, offered by Dr. Hunt, was adopted :

Resolved, That in all colleges of this association students to be graduated at the expiration of two years after admission must enter the school not later than twenty days after the opening of the regular session following this meeting.

The amendment to the constitution laid over from last year, providing for changing the name of the association to American Association of Dental Faculties, was lost.

Applications for membership laid over last year, under the rules, were taken up and the following were admitted : Royal College of Dental Surgeons of Ontario ; College of Dentistry, Department of Medicine, University of Minnesota [represented by Dr. W. X. Sudduth] ; American College of Dental Surgery [represented by E. P. Hazen].

The following applications for membership were laid over under the rules : Dental Department of Howard University, Washington, D. C., and College of Dentistry, University of Denver.

The resolution offered by Dr. Patterson was laid over last year under the rules was taken up, amended, and adopted as follows :

Resolved, That after the session of 1890–91 a diploma from a reputable medical college shall entitle its holder to enter the second course in dental colleges in this association, but he may be excused from attendance upon lectures and examinations upon the following subjects : general anatomy, chemistry, physiology, and materia medica and therapeutics.

Dr. Marshall's amendment to the constitution, providing that in all matters not in conflict with Article V of the constitution a majority of the colleges belonging to this association shall constitute a quorum, was taken up and adopted.

The following resolution, offered by Dr. Hunt, was adopted :

Resolved, That we recommend that students take two full courses in studies of a general character, such as anatomy, physiology, chemistry, general principles of surgery, and materia medica and therapeutics, and three courses in those of a special dental character.

Dr. Goddard offered the following resolution, which was adopted :

Resolved, That final examination may be taken at the end of the second year in three general studies.

The following, offered by Dr. Truman last year and laid over under the rules, was adopted :

Recommended, That for a full annual course of lectures the minimum sum of

college fees be $100; that diploma fees be omitted, and an examination fee of not less than $25 be substituted therefor and made non-returnable; that a matriculation fee of $5 be charged annually. Special-course fees to be $10 for each branch taken, and $5 matriculation fee.

The following officers were elected for the coming year: L. D. Carpenter, Atlanta, Ga., president; W. H. Eames, St. Louis, Mo., vice-president; J. D. Patterson, Kansas City, Mo., secretary; H. A. Smith, Cincinnati, O., treasurer; J. Taft, Cincinnati, O., Thurman W. Brophy, Chicago, and A. O. Hunt, Iowa City, Ia., executive committee.

The following committees were appointed: James Truman, Philadelphia; Frank Abbott, New York; and John S. Marshall, Chicago, *ad interim* committee; J. A. Follett, Boston; D. R. Stubblefield, Nashville, Tenn.; A. Wilkes Smith, Richmond, Ky., C. L. Goddard, San Francisco, committee on schools.

Adjourned to meet on Saturday, August 1, 1891, at 10 o'clock A. M., at the place appointed for the next meeting of the American Dental Association.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The ninth annual meeting of the National Association of Dental Examiners was held at Excelsior Springs, Mo., commencing Monday, August 4, 1890.

The following State boards were represented:

Colorado, Dr. P. T, Smith.

Illinois, Dr. C. R. E. Koch.

Iowa, Drs. S. A. Garber, E. E. Hughes, and E. D. Brower.

Pennsylvania, Dr. Louis Jack.

Maryland, Dr. T. S. Waters.

Kansas, Drs. L. C. Wasson and A. M. Callaham.

Ohio, Drs. J. Taft and H. A. Smith.

Minnesota, Dr. J. H. Martindale.

During the sessions the Board of Registration in Dentistry for the State of Rhode Island and Providence Plantations, represented by Dr. William P. Church, was elected to membership.

In the absence of the Secretary, Dr. F. A. Levy, Dr. J. H. Martindale, of Minnesota, was elected *pro tem.*

After discussion, the following resolution, offered by Dr. Jack and amended by Dr. Koch, was adopted, on motion of Dr. Taft:

Resolved, That this body recommends the various examining boards under no circumstances to grant temporary licenses to dental students at any period of their course of instruction, whenever their State laws will permit them so to do.

Drs. Jack, Garber, and P. T. Smith were appointed a committee to formulate the principles which this association would recommend should be incorporated in the State laws. This committee subsequently presented a report which, as amended and adopted, recommended the following principles for incorporation in laws for the regulation of dental practice or for the guidance of those framing them :

1. The creation of boards of examiners in each State.

2. The boards to be officially created by the constituted appointing power of the various States, the appointees to be selected from a number of names presented by the representative State societies ; each State society at its annual meeting placing in nomination not more then two names for each appointment to be made.

3. Recognizing five years' actual practice at the time of the passage of the law as qualifying for the continuance of practice.

4. Empowering the examining boards to examine and grant certificates to non-graduates, provided the candidates present satisfactory evidence of having had at least five calendar years of instruction.

5. These and all other examinations to be both oral and written, and candidates to be also subjected to tests of practical skill.

6. Empowering the boards to examine graduates in dentistry.

7. Prohibiting medical graduates without special qualifications practicing dentistry.

8. Requiring medical graduates to have their special qualifications determined by the same tests as other non-graduates in dentistry. (See No. 5).

9. Making failure to pass the required examination in any one branch sufficient cause for refusal to grant the certificate.

10. Making failure in the practical tests in either of the two general departments of dentistry work disqualification.

11. Expressing the opinion that examinations for the special degree in dentistry should be conducted by a board of examiners established by law in each State, instead of by faculties, as at present; and the belief that the power to grant degrees must at length become vested in boards created for the purpose.

12. Conferring on State boards the power to revoke, for cause, a certificate of qualification previously granted.

The Secretary was directed to call the attention of the American Dental Association to the fact that a case involving the constitutionality of the law regulating the practice of dentistry in New Hampshire is now pending in the Supreme Court of the United States, and asking them to see to it that it does not go by default.

Dr. Koch, from the committee on dental colleges, reported the following schools, the diplomas of which this association recommends that the State boards indorse:

American College of Dental Surgery, Chicago, Ill.

Baltimore College of Dental Surgery, Baltimore, Md.

Boston Dental College, Boston, Mass.

Chicago College of Dental Surgery, Chicago, Ill.

College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.

Dental Department, Columbian University, Washington, D. C.

Dental Department of Northwestern University, Chicago, Ill. (Now University Dental College.)

Dental Department of Southern Medical College, Atlanta, Ga.

Dental Department, University of Tennessee, Nashville, Tenn.

Indiana Dental College, Indianapolis Ind.

Kansas City Dental College, Kansas City, Mo.

Louisville College of Dentistry, Louisville, Ky.

Minnesota Hospital College, Dental Department, Minneapolis, Minn. (Defunct.)

Missouri Dental College, St. Louis, Mo.

New York College of Dentistry, New York, N. Y.

Ohio College of Dental Surgery, Cincinnati, O.

Pennsylvania College of Dental Surgery, Philadelphia, Pa.

Philadelphia Dental College, Philadelphia, Pa.

School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

St. Paul Medical College, Dental Department, St. Paul, Minn. (Defunct.)

University of California, Dental Department, San Francisco, Cal.

Northwestern College of Dental Surgery, Chicago, Ill. (The diplomas of this college are discredited after 1889.)

State University of Iowa, Dental Department, Iowa City, Ia.

University of Maryland, Dental Department, Baltimore, Md.

University of Michigan, Dental Department, Ann Arbor, Mich.

University of Pennsylvania, Dental Department, Philadelphia, Pa.

Vanderbilt University, Dental Department, Nashville, Tenn.

The following officers were elected for the ensuing year: C. R. E. Koch, Chicago, Ill., President; L. C. Watson, Topeka, Kan., vice-president; J. H. Martindale, Minneapolis, Minn., secretary and treasurer. The president appointed as the committee on dental colleges, Drs. Louis Jack, T. S. Waters, E. E. Hughes, W. P. Church, and J. H. Martindale.

On motion, the following committee was appointed to consider the advisability of holding the meetings at some other time and place than the annual meetings of the American Dental Association, with discretionary power in the matter: Drs. J. Taft, F. A. Levy, and S. A. Garber.

Adjourned to meet at the call of the president.

THE PRACTICAL PLACE.

Oxalic Acid dissolved in water and mixed, if desired, with a little tartaric acid will remove ink stains from white paper.

Dr. A. W. Buckland paints the inner surface of flasks for vulcanite work with a solution of whiting which allows the plaster to be removed easily and protects the flask from corrosion.

An Excellent Remedy.—A pint of warm water taken on an empty stomach in the morning is the safest and surest of all remedies for habitual constipation. It dissolves the fecal matter and stimulates peristalic action, thereby giving a normal action without pain. If the tongue is coated, squeeze a lemon into water and drink without sweetening.—*Exchange.*

A better plan is to take a pint of water as hot as it can be swallowed, one hour before each meal. This will not only cure chronic constipation, but is an excellent remedy for dyspepsia.—*Ed. Prac. Dentist.*

Cobbler's Thread.—Why buy waxed floss silk thread for ligatures round teeth, when using rubber dam? Ordinary cobbler's thread is very much cheaper, as strong, and in every respect as good.—*The British Journal.*

Should it be desired to remove teeth from rubber, either pin or pinless, saw the blocks off close, and put them in pure nitric acid. The rubber will be dissolved, and the teeth look new, and all trace of discoloration disappear from teeth or pins.—*Genese.*

Taking Partial Impressions.—Dr. Horace Secan first takes an impression in wax and makes a plaster model on which he places a thin layer of wax, and fits to this wire gauze, such as is used for window screens, letting the wire come only to the necks of the teeth, and not

cover the crown. Plaster-of Paris is then covered over this and the crowns of the teeth of sufficient thickness, which is removed and used as an impression-cup, using but a small amount of thin plaster. The doctor uses laundry-blue to color the plaster to assist in marking the place of separation, and glycerine as a separating fluid, with a small portion of soapstone sprinkled over it.

Preparing Root Canals.—I enlarge the canals without any exception where I can. You cannot always tell the exact length of the root so as to be able to open it up to the apical foramen. I open them up for two purposes: one is that I may better know what I am doing, and the other in order to remove a portion of the dentine. The tubuli of the teeth are filled with semi-fluid material which if permitted to remain will certainly take on putrefaction under ordinary circumstances. If you have any doubt about it, cut into a crown of a tooth in a young person, that has only recently lost its vitality, and carry a portion of the dentine to your nose, and you will find what I say is true; putrefactive decomposition has been going on. I want to remove a portion of that affected dentine, and hence I enlarge the canals where I can. Where I cannot do that, I cleanse them as well as possible by the ordinary methods.—*Dr. W. H. Morgan, in Headlight.*

Atropine as an Antagonist to Chloroform.—From the fact that atropine paralyizes the inhibitory nerves of the heart and acts as a stimulant of the respiratory center, Albertoni many years ago recommended the use of antropine in accidents occurring during the use of chloroform as an anæsthetic, or in conditions where the heart was arrested through reflex stimulation of the vagus and paralysis of respiration. He based his advice on his experiments on dogs, which, while as a rule, highly susceptible to chloroform, were yet able to sustain the administration of immense amounts of chloroform, if atropine was injected subcutaneously before the production of anæsthesia. Caselli and Secondi repeated these experiments in numerous cases of accidents occuring with the use of chloroform, and they now state that they never administer chloroform without having previously given a hypodermic injection of atropine.

In the *Centralblatt fur Kiinische Medicin*, No. 45, 1889, there is an account of a number of eqperiments made by Dr. L. Vincini in this connection, his results serving to confirm Albertoni's statements,

and success only failing to appear when such an immense amount of chloroform was given that there was coagulation of the heart tissue produced. He likewise recommends in every case of chloroform anæsthesia, as a prophylaxis, the subcutaneous injection of 1-32 of a grain of atropine. Half the amount may be given to children, while double the dose may be given in an emergency from the use of chloroform.—*Therapeutic Gazette.*

A VALUABLE TOOTHACHE REMEDY.—For violent toothache dentists may depend upon the following combination for its marvelous and instantaneous effects. It is a remedy of unrivaled power and absolutely reliable. "Break a hypodermic tablet of $\frac{1}{4}$ grain morphine sulphate, et utrophine sulphate 1-150 grain in four parts, dissolve one part in ten drops of *warm well, spring or river* water thoroughly. A perfect solution of of the partial tablet having been made it is drawn up into the syringe and the contents thereof slowly and cautiously injected into the hard gums surrounding the aching tooth. Several applications may be made until all of the contents of the syringe are injected. No danger of bad after-effects can result from the dose used, as it represents but 1-16 gaain of morphine sulphate and 1-600 grain of the powerful alkaloid derived from belladonna, "atropine sulphate." "*Sulphate* of atropine is freely soluble in water, the pure atropine is not. Tablets of the above formula may be purchased of John Wyeth & Bro., of Philadelphia. They will prove an invaluable addition to the armamentarium of every progressive dentist." Always prepare a *fresh solution for every case.—Dr. Browne, Amer. Jour.*

DR. J. BOND LITTIG writes :—As the saving of time ls an object to most dentists, I will describe a process of soldering small pieces of gold work, which, though not new at all, may be of service to many. If you have a plate with two or three teeth which you wish to attach by means of solder, back the teeth and fasten in position by means of hard wax ; then take moulding-sand and wet it thoroughly, until it is of the consistency of soft putty ; place this on your soldering block. press the plate into it, and bring the sand well up around the teeth. Now take your blow-pipe and throw a broad, gentle flame around the outer edges of the sand, taking care not to let the flame touch the plate or teeth until the water is driven off and the wax begins to blaze ; then direct the flame upon the wax and burn it off. Scrape well the parts upon which you wish the solder to flow ; then place on

the solder and borax, and proceed as usual. Partly fill a saucepan with water, and place it over a gas or oil stove, and when it boils hold the case, wrapped (investment and all) in a cloth, over the steam for half a minute close to the water; then drop it in, remove and take out the piece. Clasps and small regulating pieces are held together and soldered by this process very quickly. I have yet to crack my first tooth by soldering in this manner, which, I think, is due to the fact that the expansion by steam heat is more uniform than by dry. Sand which has been used for moulding purposes is dangerous to use, as particles of zinc or lead may be present, and thus become alloyed with the gold.

Aluminum.

Within the last year and a half C. F. Hall, an Oberlin student, who, through the development of the Cowles process, became interested in the subject of aluminum, started the Pittsburgh Reduction Company. As the Cowles boys had made their first experiments with a piece of chimney flue and a borrowed current of electricity from the Brush lighting station in Cleveland, so Hall secured his first aluminum in an oyster can. The Hall and the Cowles processes, which may be said to be modifications of one process, both the products of the Western Reserve brains, have inaugurated the aluminum age. At the last meeting of the American Institute of Mining Engineers at Washington, D.C., an entire session was devoted to the consideration of this topic, and eight or ten valuable papers were read. The so-called Herrult process from Neuenhausen, Switzerland, was described, but it seemed to be the unanimous opinion that it was nothing more than the Cowles process in a foreign land where no patent laws existed. Aluminum affords such a fascinating field of labor that men are heard of everywhere who have alleged processes of extracting it cheaply. Their number is legion, and has been ever since Deville's time. Professor T. Sterry Hunt, of McGill University, recently said: "The importance of this new instrument, which the Messrs. Cowles have placed in the hands of chemists for producing and controlling degrees of temperature never before attained, can scarcely be estimated, either in its economic or scientific aspect. The heat of this furnace realizes the dream of the alkahest, or universal solvent of the alchemists."

Practical men, doubtless, will inquire whether the aluminum industry has been really a paying investment to anybody. To this question even the most enthusiastic believer in aluminum and its future must reply that the industry so far has not been very profit-

able to any of the numerous persons and companies engaged in it. The reason given by the aluminum men is not that there is any doubt of the usefulness of the metal, at the prices at which it can now be produced, but that manufacturers do not yet understand its properties. They say that just as Bessemer had to wait for years before the merit of his process for making steel was acknowledged, so will the aluminum companies, which have laid the foundation of success, be compelled to wait till the merits of the beautiful white metal are more fully recognized, before fortunes can be made by separating it from the substances with which it is so tenaciously combined.—*Cor. Chicago Tribune.*

A Practical Method of Electro Gilding Gold Dentures, Bridge-Work, and Collar Crowns.

First prepare in the following manner a stock solution of gilding fluid. (1) Take of pure gold 30 grains and digest in aqua regia ($HNO_3 + 3\ HCl$.) ; (2) evaporate *almost* but not quite to dryness ; (3) dissolve this in twenty ounces of water ; (4) then add half ounce of cyanide of potassium. This fluid will last a long while, and should be kept in a bottle ready for future use at any time.

To Gild: Heat gilding solution in jar in saucepan of water to about 150° Fah. While this is heating, polish the denture with whiting, wash well with plenty of soap, and place it into a basin of clean water; then avoid handling or exposing it to the air.

Attach to the positive electrode a thin sheet of fine gold, which should not be less in area than the piece to be gilded.

To the negative electrode attach the denture. When the gilding solution is heated, place the positive and negative electrodes with their attachments into it.

In a few minutes a dull brownish yellow deposit will be found on the denture. Polishing on the lathe with whiting will produce a rich deep gold appearance, giving the plate uniformity of color, obscuring the distinctness between it and the solder, and giving a perfectly finished aspect which lasts for many years.

By using a battery of six (1 quart) Leclanche cells and keeping the sheet of gold always attached to the positive electrode, a piece can be gilded at any time in a very few minutes.—*By H. Fielden Briggs, D.D.S., Mich., L.D.S., Glas.*

Local Anesthetics.

Editor Items:—I write with reference to local anesthetics, hoping to benefit some one. I have experimented considerably during the last fifteen years, but never with the satisfactory results claimed by many others, one of whom I will mention. On May 10, 1890, Dr. O. L. Kean, of Creston, Ohio, came into my office claiming to have a local anesthetic, possessing all the desired qualities. He brought a letter of introduction from A. Dawson, M.D., of Meriden, Kansas, stating that Dr. Kean had spent two days at that place extracting teeth, and that he positively could do all he claimed, which was to extract teeth without pain, and without any bad results following the use of his anesthetic. Without the letter from Dr. Dawson, whom I have known for more than ten years, I should have given the subject little attention. However, this letter did influence me to stop my work and enter into a conversation on the subject of local anesthetics. Dr. Kean handed me a two-ounce bottle of his preparation, which I smelled, and then tasted, holding about half an ounce in my mouth a minute. After carefully noticing the effect, I said to him, "It must be nearly what I already have." This seemed to surprise the man from Ohio. Our local anesthetic was produced, and, after careful comparison of color, smell and taste I could see little difference, though Dr. Kean could see a wonderful difference, and greatly desired that I allow him to use his preparation on one of my patients, that I might see its wonderful effect. But thinking that the proof of the pudding was in the eating of it, I said, "Doctor, I have a tooth that must come out soon, so you may proceed with me, just as you would with any other person." I do not think he liked this suggestion, but he went boldly to work with a hypodermic needle, making four injections of his anesthetic, around the neck of the tooth. In about a minute the tooth was extracted, and I experienced about half the usual pain. Dr. Kean left our city without selling his anesthetic, or an "office right" to use it.

I shall never forget that dear doctor. No, Sir! My mouth was too sore, and is hardly well yet. But I escaped better than some of my neighbors, especially Mr. W. H. Detchon, who was under the care of his physician for more than two weeks, and is still cussing the "painless dentist." Bad results followed each operation performed here by Dr. Kean, and varied only in proportion to the amount of the anesthetic used.

Here is the formula for a local anesthetic which is good, but I do not advise injecting it into the tissues:

℞. Cocaine mur.................................gr. xxxv.
Ol. menth. pip..................................℥ ss.
Tr. aconite.......................................ʒ iij.
Sulph. ether......................................℥ ss.
Chloroform..ʒ v. M.

This is recommended for topical application by Prof. R. L. Cochran, lecturer in the Dental Department of the State University of Iowa. Dry the tooth and surrounding gums; then, with a piece of spunk saturated with this anesthetic, apply it where you want it, and nowhere else.

I have also found the following good in minor surgical operations, such as lancing a felon, or removing a small tumor from the scalp or face: Take any quantity of alcohol, and add menthol till you have obtained a saturated solution, then add twenty drops of chloroform for each ounce of alcohol. Apply with a small piece of cotton, or spunk, allowing the air to get to the parts freely for from three to five minutes. Then operate.—*Dr. C. H. Gillman, Valley Falls, Kas.*

A THICK tincture of benzoine on cotton is an excellent substitute for sandarach as a temporary stopping. It is also more agreeable to some patients than chloro-percha. It deserves consideration also as a material for filling roots.—*Odontographic.*

SENSITIVE DENTURE.

Dr. Bogue recommends the following formula for sensitive denture: Veratria, such quantity as you please, dissolved in absolute alcohol, to which add an equal volume of glycerin and carbolic acid. A few months since, I took cocaine, *quantum sufficit*, dissolved it in absolute alcohol, and added tannin to saturation; to this I added carbolic acid and glycerin, an equal volume of each; the same idea being present that Dr. Curtis has advocated. Of these two mixtures I take equal quantities, mix them together, and put them into the cavity. If I put it into a large cavity and go to work at a small one, by the time I have finished the small one the other is pretty near devoid of its sensitiveness.

The element of danger in it is the *veratria*, which should be carefully guarded against, *one-fifty-second of a grain* being the dose.

Dr. Dwinelle said—In reference to obtunding hypersensitive dentine I have very little difficulty in the matter. Hot air is quite sufficient in most instances, but in ninety-nine cases out of one

hundred I use simple chloride of zinc. I recommended it to the profession a number of years ago. Sometimes it produces a little pain for a few minutes, but usually nothing to speak of. I apply it with perfect audacity and impunity under all circumstances. I never devitalized a pulp with it in my life. Sometimes I have used it in a somewhat heroic sort of way. I have dried my cavity and filled it full of the salt of chloride of zinc, and then, in order to enforce and project it into the sensitive dentine, I have applied a heated instrument to it; and without any subsequent trouble I think the sensitiveness of dentine can be very easily overcome with this agent.

Dr. Cook—How does the patient feel about it?

Dr. Dwinelle—That is a very important question to ask. Perhaps in the majority of cases there is some pain, but oftentimes little or none; as the patients say, "none to speak of." The philosophy of it is simply this: We actually destroy for the time being the sensitive fibrillæ projecting from the nerve itself, the fibrillæ in the dentinal tubuli. We have a great many cases of hypersensitive dentine which are very serious, especially at the cervical points of the teeth. I have had people come to me who could not breathe sidewise into the mouth upon the teeth without pain. One of my patients told me that in drawing in her breath the shock was so great that she positively dropped to the floor and was supposed to be in a fit. There was no erosion apparent in this case. In applying the chloride of zinc to these sensitive places by the gum, I first put on the rubber dam, adjust it to its place so as to draw the gum up to the periosteum, then apply the pure salt, and enforce it with a heated instrument. Sometimes, in a couple of weeks the patient has come back for a renewal, but very rarely after the second application. I have great confidence in the efficacy and safety of chloride of zinc. I am perhaps like the shoemaker who thought there was nothing like leather!

Dr. Dwinelle—While I was on the floor a moment ago the query was made whether there was any considerable pain connected with the application of chloride of zinc. I admit that there is at times, but not as much or often as one would suppose. By applying the salt, pure and simple, and allowing it to deliquesce (by absorption), it is far less painful than when used in a liquid solution. In extreme cases I have qualified it with great success by drying the cavity and introducing cocaine for a short time and then applying the caustic. In such cases the patient never complains of pain. I sometimes use alcohol and other remedies, but chloride of zinc is my sheet-anchor, and I seldom have occasion for any other agent for obtunding sensitive dentine.

The following excellent answer by Professor C. N. Peirce to the query of H. J. S., of Chicago, we glean from the pages of the *Dental Mirror:*

Editor Mirror: I wish to know whether the premature extraction of temporary teeth tends to render the permanent set irregular. For example, would the extraction of the second temp. molar allow the six-year molar to erupt forward and so crowd the bicuspid which appears later? Should like to have the opinion of Dr. C. N. Peirce.

H. J. S., Chicago.

In my judgment the premature extraction of the deciduous teeth has just this influence on the permanent set: Taking them in order from the median line of the mouth, the permanent central and lateral incisors are but little, if at all, modified in their position by the premature extraction of their predecessors. It is not so with the cuspids. The premature removal of the temporary cuspids not only permits but encourages the first bicuspid to move forward and occupy a position near the lateral; in consequence of which its successor must erupt out of line either laterally or within the arch.

The premature removal of the first deciduous molar, either superior or inferior, has little or no effect on the position of its successor, the first bicuspid; but the removal of the second deciduous molar, if occurring as early as the first of the fifth year or earlier, must have a decided influence on the position of first permanent molar in either jaw, but especially in the inferior maxilla.

The jaws grow posteriorly to the position occupied by the deciduous teeth; and the evolution or development of the first, second and third true molars is an important factor in stimulating the growth of these bones. The removal of second deciduous molars prior to the appearance of the first permanent molars, and while the crowns of their successors, the second bicuspids, are but partially formed, removes all the tension and stimulating influence which these teeth exert when in position. Hence the lack of jaw-development in the region of the tuberosity and of the ramus, and the necessarily shorter jaws, causing crowding of the bicuspids.

If any one will watch the mandible during the period of molar development, he will find that the relation existing between each molar and the ramus is very similar. The first molar in its position, as it makes its exit through the mucous surface, is quite as near to the base of the coronoid process as the second molar is in its exit. If the direction and support which the second deciduous molar gives to the mesial surface of the first permanent molar is removed, the

pressure of this advancing molar against the anterior portion of the ramus is also absent or greatly modified. Hence we have the presence of the anterior line of the ramus or base of the coronoid process acting as a force to push forward the first molar into space which had been previously occupied by the second deciduous molar, which space a few years later should be occupied by the second bicuspid.

C. N. PEIRCE, Philadelphia.

ON MAKING CAVITIES IN ARTIFICIAL TEETH FOR GOLD FILLING.

BY OLIVER P. LUND, M. D., D. D. S.

Drilling, excavating and preparing a cavity in a porcelain tooth is a bit of practical dentistry that the profession has not yet given a warm welcome and recognition as a "highly interesting operation." So it is generally relegated to the kind attentions of the dental supply house; the dentist very properly being unwilling to operate where the only person who could possibly be hurt is himself. At least so the laity would say if they knew aught about it.

Nevertheless I have found upon investigation that there are "store teeth" occasionally which suffer excruciating torture in the hands of unskillful operators, or through unwise directions being given; and it is with the purpose of alleviating such sufferings, as well as to detail a few ideas which may be of value, that this article is written.

These cavities and fillings are becoming more and more popular. They please the patient, improve the natural appearance of the work and bring a nice addition to the practitioner's honorarium. It seems to be so easy to mark the place, send and have the cavity drilled, and then fill it under the most favorable circumstances. But right here does the devoted fang sometimes bite off an ell of trouble for its intending anatomist, so that some useful hints, gathered from a considerable experience with this species of *dens hominis*, if not *dens humanus*, may save a great deal of trouble, if not future mortification.

If the dentist would take the trouble to drill the cavities himself, provided he could spare the time; and would get the appliances for doing so, which are but little expensive, he would avoid delays, risk of breakage in the mail and save the cost of the work and postage. Of course if he has to order the tooth or select it himself in the depot, that is a different case, and certainly if a tooth has to be made to order, the cavity can be drilled before it is burned.

But in any case, in order to save our stony hearted patient from unnecessary abuse, the size, shape and position of the cavity is of

first importance. Here is where the first error is apt to be made by not taking into consideration the difference between a natural and an artificial tooth in shape and structure. The object, of course, is to have the filling show well and look natural, so that it is natually placed upon the side of an anterior tooth. In natural teeth, however, cavities are generally more extensive upon the palatine surface, and reach around to a less degree if at all upon the labial surface. Or where they are smaller they may be confined to the approximal surface entirely.

Now in endeavoring to imitate this, many mark their cavities to be drilled entirely in the approximal wall, overlooking the fact that artificial teeth, especially gum teeth, are necessarily much thinner than natural ones, and that porcelain is a more brittle material than dentine. Such a cavity, penetrating from the side of a porcelain tooth must leave very thin and brittle labial and palatine walls, and the tooth may break in the filling or afterwards in the mouth of the patient. Unless the tooth is quite thick and bulky the cavity should be allowed to come more toward the labial surface. Penetrating from this angle it will allow stronger lateral walls; certainly as it shows more prominently it is usually desired there, but occasionally not. It need not extend far on the face of the tooth but should not be entirely limited to the side.

Again some patients desire to have the cavity show as much as possible and for that reason wish them to be very near the cutting edge. This is a great mistake in a small or thin tooth, and may be carried too far in a large one. The more the cavity penetrates toward the thin cutting edge, the more the tooth is weakened in a manner which porcelain will not stand, and ill results may follow. The cavity must be undermined and some of this must go further toward the cutting edge, exactly as in natural cavities in this situation it is seldom possible to get along without a small pit or undercut in this lower angle.

For these same reasons cavities should not be too large and infringe too much on the tooth material. The patient may want a big filling showing but the size and shape of the tooth must be considered, in regard to what loss of material it will allow. From an æsthetic point of view a tooth is considered disfigured by an excessively large filling in it. Why then as artists should we disfigure our work of art?

As for the shape of the cavity, while a simple ellipse or oval answers every purpose, yet taste may dictate any varieties so long as the above hints are regarded. Sometimes a patient will insist on

having a round hole filled on the face of the tooth. It is easily enough put there but for looks it is just as natural and beautiful as a mustache dyed black on a strawberry blonde. A very natural looking cavity can be made by drilling a long elliptical hole across the neck of the tooth to imitate the peculiar form of caries which occurs there. It is by no means ornamental but looks very real.

The process of drilling a cavity is well known, but a few hints may be useful. Have a small assortment of diamond drills which may be obtained of a lapidary or at the depots. Two or three large ones to cut out the cavity and one or two small ones to make under-cuts are sufficient. Have some small corundum points and wheels such as are used on the engine. The work can be done by the dental engine, in which case the tooth should be secured by cement or in any other way so that it will not slip and be broken; or if the operator has a good true lathe head and a large driving wheel so as to get rapid revolution, the work can be better done by using the drills and points on this lathe, holding them by means of a split chuck and bringing the tooth against them. By this means more control is had over the work and greater force can be exerted on the diamond drills. Whichever method is used, begin with a corundum wheel of the right size for the cavity and grind out a depression just the shape desired. Take one of the larger drills and drill into this depression in one or two places running the lathe or engine very rapidly, and then extend by working laterally with the drill until the whole depression is thoroughly excavated to the proper depth. Be careful not to get beyond the boundaries of the cavity as ground out by the wheel or the edge may chip off.

Next bevel the edges slightly with a conical corundum point exactly as the walls of enamel in a natural tooth would be trimmed. This gives a fine smooth edge to pack gold against.

Finally, with a small drill make the retaining pits deep enough to give a good hold for the gold. This work must be done with a very steady hand, as a slip will break the tooth. If the cavity was not very deep in the first place, the pits should be joined by working the drill across the bottom from one pit to another; very slowly and with little pressure or the drill will soon be worn out.

Grooving may be done to save loss of tooth material from deep retaining pits, or in some cases it may be necessary. It does not pay to do it by working with the point of a drill, but it can be neatly done by means of very small wheel points made of soft steel or iron, and used with diamond dust. These wheels can be turned on a lathe

from stems of old points and should be small enough in diameter to go to the bottom of the cavity, resembling, in fact, an ordinary small burr wheel and used similarly for grooving. Apply the diamond dust with glycerine, and use a minute quantity of the dust, which can be bought in a small quantity at slight expense, and will last for years at this work. Grooving under the edges of the cavity will avoid the necessity of making deep pits and also of connecting them with the small drill.

But for ordinary purposes grooves are not necessary, unless much of this work is done so that it will pay to groove and save wear and tear on drills.

This then about sums up a penetrating subject in which there is room for the exercise of ingenuity in improving methods and results.

BOOK NOTICES.

Irregularities of the Teeth and their Treatment. By Eugene S. Talbot, M. D., D. D. S., Professor of Dental Surgery in the Woman's Medical College, Lecturer on Dental Pathology and Surgery in Rush Medical College, Chicago. Second edition, revised and enlarged, with 234 illustrations, 169 of which are original. Published by P. Blakiston, Son & Co., 1890., 1012 Walnut street, Philadelphia, Pa.

To all dentists who give their attention to the correction of irregularities of the teeth, this work is specially recommended. Within quite a short time it has gone through two editions, which is an evidence of the favor with which it has been received. The present edition is very much enlarged, exhibiting a painstaking revision and re-writing of many parts of the work. Many of the cuts are entirely original, showing forms of anomalies and irregularities of both position and number which show both artistic skill in this part of the work and anomalies that can hardly be credited. We commend the work to the profession generally, and compliment Dr. Talbot on the production of such a volume. ED.

A Compend of Dental Pathology and Dental Medicine, containing the most noteworthy points upon the subjects of interest to the dental student. By Geo. W. Warren, D. D. S., Clinical Chief, Pennsylvania College of Dental Surgery. Illustrated. Cloth, $1.00. Interleaved, for taking notes, $1.25. Philadelphia: P. Blakiston, Son & Co., No. 1012 Walnut street. 1890.

Many of the works on the subjects of which the above treats are cumbersome, oftimes prolix, and containing matter which, though not irrelevant, is not absolutely necessary for the student to know. The aim of the author has been to select only such matter most necessary to chain the attention, and such points as are of importance for the student to study and familiarize himself with. Its conciseness recommends it to every dental student. Ed.

A Treatise on the Irregularities of the Teeth and their Correction- including, with the author's practice, other current methods. Designed for practitioners and students. Illustrated with nearly 2000 engravings (not embracing those in the third volume). By John Nutting Farrar, M. D., D. D. S., graduate of the Jefferson Medical College, Philadelphia, and of the Pennsylvania College of Dental Surgery, &c., &c. Vol. I. New York City: 1888.

This great and wonderful work on the subject which its title indicates, is one which no practitioner of dentistry can afford to be without. Its scope is wonderful, its research thorough, its labor overwhelming. There seems to be (so far as the first volume goes,) no subject connected with the irregularities of the teeth, whether near or remote, that has escaped the author's attention, nor been more carefully and lucidly treated. The size, style, typography and "get-up" generally are all most commendable. We commend the work as a most thorough treatise of the subject and an encyclopædia of Orthodontia, to which any case requiring treatment will find simple and effective appliances. Ed.

The Physicians Visiting List for the year 1891. Philadelphia. P. Blakestin, Son & Co., 1012 Walnut Street.—This book has been published for the last fifty years, and each year with some improvement which the times and the strides of the profession suggests. The present edition is recommended for its strength, compactness, convenience and durability, essential qualities for the hard usage the book receives. It contains an Almanac for 1891, Table of Signs, Marshall Hall's ready method in Asphyxia, Poisons and Antidotes, The Metric or French Decimal System of Weights and Measures, Dose Table, List of New Remedies, Aids to Diagnosis and Treatment of the Diseases of the Eye, Diagram of the Eruptions of the Teeth, Posological Table, Disinfectants, Examination of Urine, Incompatibility, a new table for calculating the period of Utero-Gestation, Sylvester's method for Artificial Respiration, Transportation of Injured Persons, Diagram of the Chest, etc.

THE

Dental Office and Laboratory.

FOURTH SERIES.

VOL. 5. PHILADELPHIA, MARCH. 1891. No. 2.

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S.

(Continued from Page 7, Vol. 5, No. 1.)

GUTTA PERCHA.

There is not, probably, a more reliable material for filling and preserving teeth than gutta percha. Could it be made, after its introduction into the cavity, as hard as a gold, amalgam or even as an oxyphosphate filling, it would, par excellence, be *the* filling material. It preserves the tooth, it is easily introduced, and it approximates in color to the tooth.

Gutta percha is the inspissated juice of trees, called the *Isonandra Gutta*, which grow profusely in extensive forests in the East Indies. In its crude state it is of a chocolate color, but when commercially prepared it is of a grayish white. It is excessively tough and tenacious, and is prepared by softening it in hot water, when it is torn into shreds and slices by heavy machinery and purified of its foreign matter with frequent washings.

It is not soluble in water at any temperature, but is freely so in chloroform, with which it may be made into a thick cream, and used thus for dental purposes. Gutta percha may likewise be dissolved in the sulphide of carbon, also in benzol and the oil of turpentine. The former article requiring heat to effect the solution, while the latter requires to be used quite hot. It is not affected by the alkalies, but concentrated nitric acid attacks it readily. It is one of the best non-conductors of electricity and of heat and for this purpose is frequently used as an intermediate in cavities where the nerve is nearly exposed.

Gutta percha is combined with mineral substances for dental use, such as quicklime and feldspar. These ingredients are incorporated with it while it is in a plastic condition, induced by heat.

The solution of it, in chloroform, is useful for the relief of tooth-

ache when the pain arises from an exposed or inflamed pulp, and likewise for the filling of roots.

For dental uses the material is softened over a water bath, such as is shown in Fig. 112. Any dentist can make one of these for himself A represents the body of the lamp and B the cover of the same, which is removed for replenishing with alcohol, but in lieu of this a glass lamp, such as is shown at Fig. 113, will serve the purpose. C is the tube for the wick, D is the boiler made of brass and hard soldered with silver solder, E is a vent hole, F is a tube soldered to the top of the boiler to replenish with water, G is a cover to this tube, HH is a rod which is soldered to the ring M for the support of the boiler, L is a small piece of brass soldered to the rod HH between the ring for the purpose of bringing the boiler directly over the flame, J is a tube soldered to the boiler by which it may be pushed away from the frame when the water boils too violently or when the lamp is needed without the boiler, K is a small screw set into the rod HH to keep the boiler the proper distance from the flame, N is a cover to be put over the wick when the boiler is not in use. The appliance, such as is shown in the supplementary cut, Fig. 112 A, may be removed from the lamp and set aside until wanted. It is important to use hard solder in making the appliance, for should it be forgotten to replenish the boiler the heat from the blaze would melt it if soldered with soft solder. The boiler may be filled with water either with a pipet or with the dental syringe. It should not be kept more than $\frac{1}{4}$ or $\frac{1}{3}$ full.

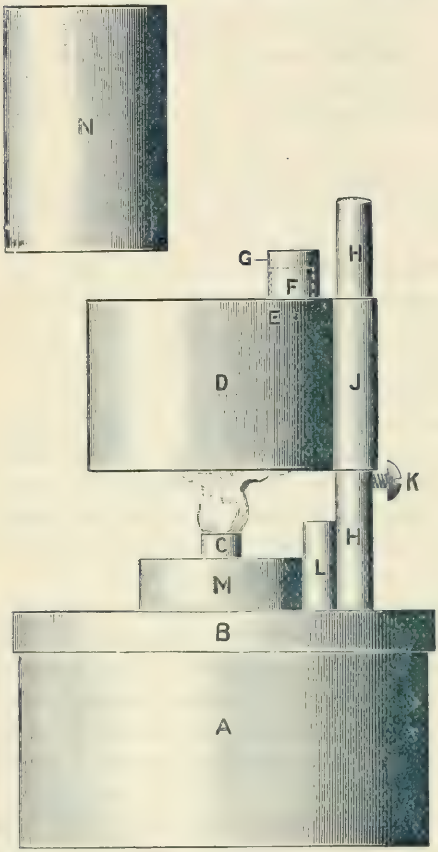

FIG. 112.

To use gutta percha it should be cut up in pieces of a size proportionate to the size of the cavity to be filled. These should enter the cavity easily, and each piece packed in well before another piece is added. They should be placed on the top of the boiler (Fig. 112) and softened by means of the heat from the hot water. A small ball burnisher, or an instrument such as is shown at Fig 114, will be found very convenient for filling small proximate cavities with gutta percha.

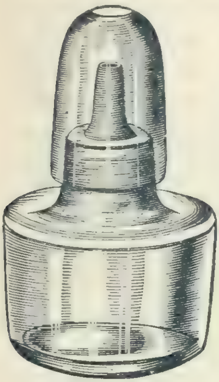

Fig. 113.

When the cavity is filled, a hot instrument like either of these shown at Fig. 115, will be found applicable to remove the surplus of material and bring it even with the borders or edges of the cavity. Sometimes, however, a hot instrument will not do this and a feather edge is left. This may be removed with a very sharp abscess lancet, or by dipping a piece of ball lamp wick in chloroform and using a sawing motion with this, until the feathered edge of the material is disolved away by the chloroform.

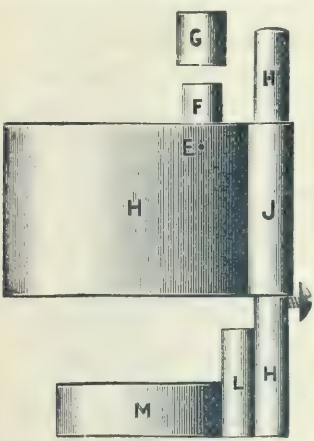

Fig. 112 A.

There is no material so reliable and serviceable as gutta percha for filling of children's teeth, and in localities where the material is not subjected to the wear of mastication the teeth of children of larger growth may be reliably filled with it. Indeed, we think for all proximate surfaces, for the buccal surfaces of upper and lower molars, or the cervical cavities frequently occurring in the incisors, cuspids and bicuspids, whether for children or older persons, gutta percha may be relied on when gold or other material will fail. If it be desired to preserve a root, should the patient be not prepared to have it crowned, gutta percha packed into it will preserve it, though the material may be worn away by chewing on it until it is reduced to the thinest disk. If it be desired to force two teeth apart, which may need filling, but which the dentist may not have time to do for a month or two or more, gutta percha packed in such proximate cavities, and bridged from one tooth to the other, will serve a most valuable end and preserve such cavities from further decay for a long time.

FIG. 114.

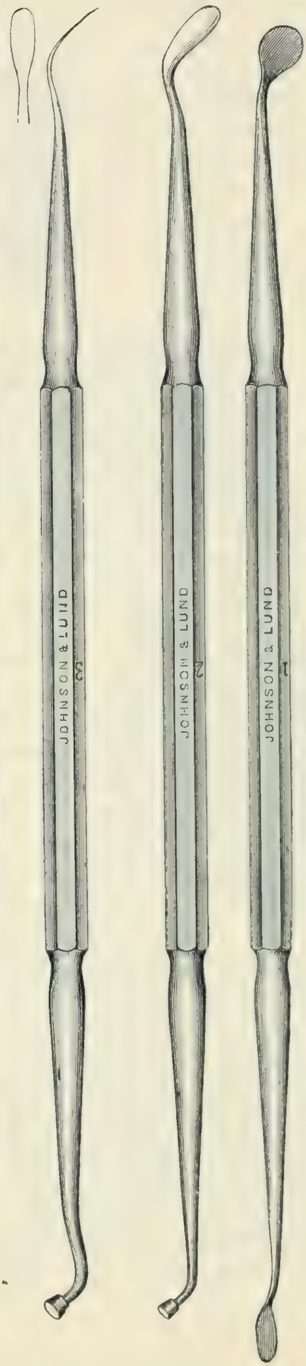

FIG. 115.

If the teeth have been forced apart, and are too sore to be worked on, by packing gutta percha between them, the space gained either by the separator or by the action of the separating rubber will be retained and the soreness entirely overcome.

There is nothing like gutta percha to secure a crown to a root, especially when a dowel enters the root canal, and wherever this material can be used for securing crowns, with dowels to roots, its use will be found much better than the cements occasionally used for this purpose.

Data have been kept of the durability of gutta percha fillings, and these have extended into as many as *fifteen years*, and have preserved the teeth perfectly during this time. There is no reason why they should have done so longer, only that it is noticed that certain makes of it disintegrate, and in consequence require renewal.

It is true of gutta percha that it may be used in very frail crowns, where scarcely anything but the enamel remains, and yet these are preserved without that breaking away which we observe when cases of the same nature are filled with amalgam.

Gutta percha may be used by bridging from one tooth to another, and Dr. Bing, of Paris, has filled two (if not three) teeth in this way, protecting

the masticating surfaces by laying on a piece of pure gold, to which loops are soldered to the underside.

We present an ideal case of this kind in Fig. 116 A. In this figure is shown the condition of the two bicuspids and first molar eaten away by decay to mere shells. The roots are cleansed and treated, and the rubber dam being applied the teeth are filled with gutta percha, as shown at Fig 116 B. An impression of the teeth, as shown at B, may be taken with the following impression material. Take a given quantity of Fuller's earth or pipe clay, and mix it with such a quantity of glycerine as to form it into a putty-like mass. When well kneaded together place a sufficient quantity of this dough into an impression cup. Wipe the parts dry and take an impression. Any of the fusible metals, (formulas of which will be found in the recently published book "The Dental Laboratory," at page 63,) may be poured into this impression, and on the die thus made a small piece of pure gold is burnished to fit. Small loops or headed platinum pins from old mineral teeth may be soldered to the under side of this plate, as shown at Fig. 116 C.

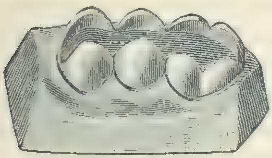

Fig. 116 A.

Fig. 116 C.

Before soldering the loops on pins, it should be tried on the teeth, as shown at Fig. 116 B, and accurately burnished into place over the gutta percha. It is applied by warming it in the blaze of a spirit lamp until warm enough to enter by its own heat into place in the gutta percha. Should it not be hot enough to go well into place, a large instrument, like a plate burnisher, may be heated in the blaze and applied to the point needing adjustment.

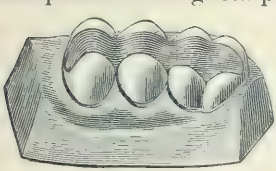

Fig. 116 B.

If the case is one which cannot be carried to completion at once, a plaster impression may be taken of the teeth as shown at B, and from it a model made. From the model a die of (Melotte's metal) may be made and in it the gold plate fitted, after which the loops or pins may be soldered to the underside of the plate and all gotten ready for application at another appointment.

The same procedure may be observed for filling teeth with gutta percha for single teeth, as shown in Fig. 117. Dr. Bing used this method also; but Dr. Chas. Essy elaborated it by filling the decayed places with wax first, and then carving this in imitation of the depressions and elevations of the crowns on which he worked, after which

impressions were taken, models and dies made and the work completed, as shown by Fig 117.

Gutta percha is almost universally conceded to be the best material with which to fill children's teeth—the permanent ones—from the sixth to the twentieth or twenty-fifth year, in such places where it is indicated, especially when these teeth are of a soft or chalky nature. Indeed, in after life, it serves a valuable purpose in adult nature, and even in advanced life.

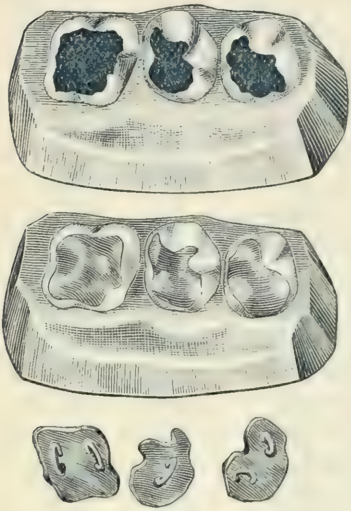

Fig. 117.

Oxychloride of Zinc.

This material is made as follows:

Oxide of Zinc.........30 grs.
Borate of Soda....... 2 grs.
Fine powdered Silice 1 gr.

These ingredients are mixed thoroughly and put into a crucible. The mouth of the crucible is then covered and securely luted, when it is subjected to a bright red heat. It is then removed from the crucible and ground to a fine powder, and then mixed with three times its weight of calcined oxide of zinc. This forms the powder. The liquid is made of deliq. chloride of zinc, one fluid ounce to which five or six fluid ounces of water are added.

This material was at one time extensively used as a nerve cap, but it did not prove successful, and has to a great extent been abandoned. It is now much relied on as a filling for root canals by many operators. It is used as a filling material, but its use as such has been greatly superceded by the oxy-phosphate preparations. It is oftener employed in devitalized teeth than otherwise, or as a formation on which gold or amalgam fillings are built. It grows more intensely hard than the oxy-phosphate fillings.

Oxy-phosphate of Zinc.

The oxide of zinc is calcined for two hours in a crucible properly luted, at a white heat until it becomes a hard yellowish mass, when it is pulverized in a mortar, and passed through a sieve of fine bolting cloth. The liquid is made by taking an ounce of German glacial phosphoric acid in crystals, dissolving this in one fluid ounce of

water, and then evaporating the solution to one third, on a sand bath.

This material has grown into great popular favor with dentists on account of its many uses.

It is used as a material for filling teeth, and many operators claim reasonable successes with it.

It seems to be subject to a melting away or disintegration at the cervical borders of the cavity, on which account it is not regarded a permanent filling material. This has been in a great measure overcome by painting the interior of the cavity with chloro-percha, or a varnish of gum sandiach or balsam of fir dissolved in chloroform, or by placing a very thin disk or filling of gutta-percha at the cervical margin, and over these using the material.

It is extensively used to strengthen frail teeth, to which gold or amalgam is added, by shaping a cavity where these materials will not wholly rest on the frail edges.

As an intermediate for filling crown or large proximate cavities, which encroach near the nerve, where the interposing of a non-conducting material is indicated, it is extensively used.

For the securing of all gold crowns, and sometimes those with dowels entering the roots it is also found of great service.

It is of inestimable value for securing bands to teeth in the effort of the dentist in regulating the teeth.

The powder has been incorporated with fine gold filings and these mixed with the liquid, which makes a filling resembling gold; the same thing has been done with fine alloy (amalgam) filings, by which a filling like an amalgam filling is made, but we are unable to state whether there is any advantage gained by such a combination, or whether by such combinations the disintegration noticed at the cervical edges of cavities, already alluded to, is overcome or not. By such combinations contour fillings are more quickly and readily performed.

[SEVENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

Q. Does the abscess always make a tract in the locality you have mentioned?

A. No. From a lower molar it may find a vent on the cheek or neck; or it may, from an upper molar, open into the ear. From an incisor it may follow the suture of the maxillary bones and burst in the roof of the mouth or near the soft palate, or it may enter the

nose and find a vent there. Or it may enter the maxillary sinus. through the nasal plates of the upper maxillary bones.

Q. What do you mean by the *suture* of the maxillary bones?

A. It means the marginal union of two flat bones. When two bones are united together in that way, they are, as it were, sewed together, from which the word is derived. This sewing together of flat bones is never so close but what a little canal or space exists between the two bones, which offers less resistance to the pressure of the pus than the solid bone, so that the abscess finds an easier vent in such places than elsewhere. An abscess will always select a place for an outlet offering the least resistance.

Q. What is the character of the pain of a forming abscess?

A. It is deep-seated and throbbing, and often so excruciating and severe as to be insupportable, driving the sufferer to the wildest despair.

Q. Does this pain last any length of time?

A. It may continue from three to ten days, but its intensity is at its worst *before* suppuration takes place. Once pus begins to form, it loses some of its severity, and when the pus has found a means of escape, it almost ceases. But even then the tooth from which the abscess proceeds remains tender and sore for several days, due to the thickening of the alveolo-dental membrane.

Q. Is a patient liable to a second attack of the disease?

A. From the susceptibility of the alveolo-dental membrane to inflammation, a patient is liable to a recurrence of the disease, but this is not general or frequent, nor is the second attack ever so severe as the first.

Q. Does the disease ever assume a chronic form?

A. It does. The inflammation does not always entirely subside, and the sac at the extremity of the root secretes pus in small quantities and escapes through the fistula in the gum.

Q. Is alveolar abscess more liable to occur with some persons than with others?

A. Yes. Persons of a scrofulous diathesis are more liable to take on the disease, when their teeth are badly decayed, or from any of the causes which tend to the disease, than others, and with such it most generally assumes the chronic form.

Q. What do you mean by diathesis?

A. It is a certain condition of the body which makes the person more liable to certain diseases.

Q. Does the pus secreting sac always have an invariable point of attachment?

A. Not always. We find it sometimes on the sides of bicuspid teeth, between the bi-furcation of the roots of the molar teeth, or on the sides of these, and sometimes on the labial surfaces of the incisors; yet the ends of the roots of the incisors, cuspids and bicuspids, and the palatine root of the upper molars, are the points to which they (the sacs) most generally attach themselves.

Q. Is the disease amenable to treatment?

A. It is, in many cases. Yet, like all diseases, it may remain apparently cured for many years, and for some unaccountable cause —the sleeping in a draught, the taking of a cold, the getting of the feet wet, or getting over-heated—may lead to its recurrence.

Q. Are some teeth more amenable to treatment, for this disease, than others?

A. Yes. All of the upper oral teeth first, the bicuspids next, and the molar teeth next may be cured by faithful and thorough treatment. Yet even these are liable to exceptions; for as there is no certainty of determining where the sac is located, and as it is only by breaking down the pus secreting organs of the sac that a cure may be looked for, the treatment, though thorough, is attended with ambiguity. The treatment of the lower teeth for this disease is attended with less certainty than the upper ones, but of these, the lower cuspids and bicuspids offer the most favorable chances.

Q. What is the character of the secretion from an alveolar abscess?

A. In good, healthy constitutions it is of a thick or creamy consistency, and of a yellowish—almost canary—color; but in others it presents a watery, lymphy, vitiated, acrid condition, and is very irritating in its effects upon the living tissues.

Q. Why is it that when an abscess bursts on the face or cheek it leaves such an ugly scar?

A. Because, after the healing of the fistula, a dense cord is formed which binds the skin to the bone.

Q. Can this deformity be remedied?

A. By severing this connecting link or cord, the scar may be greatly improved in appearance.

Q. What are the causes of alveolar abscess?

A. Inflammation of the peridental membrane, either by a blow on the teeth, or by extensive decay exposing the pulp, or by a drill accidentally piercing the canal through the side of the root, or the filling of a cavity of decay in a tooth, permitting a dead or decomposing pulp remaining in the crown and roots, or by a root filling passing beyond the end of the apical foramen.

Q. What is the treatment for this disease?

A. The first treatment should rather be to prevent the abscess, to abort it, if possible.

Q. How is this accomplished?

A. By the application of yeast poultices to the affected part, upon which equal parts of borate of soda, boric acid, salicylic acid and powdered tannin are dusted; or a moderate dose of calomel may be administered internally. This treatment will frequently prove efficacious if it is resorted to in time, when the local symptoms are first observed. Or massage may be employed with the fingers at and around the affected tooth, on the gum, with an ointment composed of $2\frac{1}{2}$ drachms of salicylate of bismuth and $7\frac{1}{2}$ drachms of lanoline.

Q. Why is it better to resort to this abortive treatment than to let the disease run its course?

A. Because, first, of the old saying, "An ounce of prevention is better than a pound of cure;" and secondly, when it is cured, the integrity of the parts is so impaired that a recurrence of the disease may at any time take place; and thirdly and most potently, to avert the dreadful suffering connected with it.

Q. But if this treatment fail in its object, what are you to do?

A. Resort must be made to surgical treatment in the removal of all irritating matter from the pulp cavity.

Q. What are the chances of success in the surgical treatment?

A. Success is more attainable when the abscess is of recent origin, and when it is confined to the disintegration of the pulp, than when it is of long standing or chronic, or when the disease has involved the adjacent parts.

Q. How would you proceed to this end?

A. Ready access must be made to the parts involved, so that the sac may be broken up and the pus evacuated as soon as possible.

Q. Will you describe how this is done?

A. An opening is made with a drill or trephine through the process, either guided by the fistulous opening or by where the end of the root is, when the sac is broken up with nerve instruments and the pus purged away.

Q. Is this all that is necessary to affect a cure?

A. Sometimes healthy granulations will develop by this treatment, but at others resort must be had to therapeutic treatment.

Q. What do you mean by therapeutic treatment?

A. It means the application of remedies with a view of affecting a cure.

Q. After you have resorted to this surgical treatment of drilling

through the alveolar process and breaking up the pus secreting sac at the end of the root, what therapeutic treatment would you pursue?

A. This consists of first removing all irritating and putrescent matter from the root canal freely to the apex, and the application of disinfecting remedies to this part, when the opening made through the gum and bone to the socket should also be thoroughly disinfected, and the fistulous opening not allowed to heal until all odor of putrescence has disappeared. Tepid water should be used at first, both in the root canal and along the fistulous tract by means of a small dental syringe, after which disinfecting agents resorted to. This treatment must be continued at intervals until a cure is effected.

Q. What remedies would you use for this purpose?

A. A combination of remedies is sometimes necessary in obstinate cases; such as creosote and tincture of iodine, carbolic acid and tincture of iodine, or creosote and tannin in alcohol, as well as many other disinfecting remedies.

Q. Is not the sac at the root end difficult of removal?

A. It is sometimes quite so, but it may be accomplished with a small trephine.

Q. Suppose you should find necrosed bone in the socket, what remedies would you use?

A. Diluted aromatic sulphuric acid is very reliable in these indications, either alone or combined with a small quantity of tincture of capsicum. In the heroic treatment of necrosed bone, pure sulphuric acid has been recommended. This must be used with due caution.

Q. Does the inflammation of the investing membrane always result in alveolar abscess?

A. No; but in the inflammation of this membrane, attendant or accompanying the eruption of the lower wisdom teeth, serious results are often produced. The irritation in these cases has, in some cases, extended to the lungs, and has been, in consumptive persons, the exciting cause of consumption.

Q. Are any serious results noticed from the effects of alveolar abscess from the temporary teeth?

A. Yes. The exfoliation of the bone of the sockets of the teeth has been traced to this disease, whereby the rudiments or gums of the permanent teeth have been seriously injured, and sometimes destroyed. [TO BE CONTINUED.]

LABIO CERVICAL CAVITIES.

By Theodore F. Chupein, D.D.S.

In writing on the above subject in a series of articles on "Operative

Dentistry," now being published in this journal, we took occasion to mention several form of clamps that were serviceable for keeping the rubber dam out of the way, and aiding in the performance of the operation. These cavities, as all dentists know, are often of a most tantalizing nature because of the inability to keep the dam clear of the borders of the cavity, so that proper manipulation may be carried out. Among the clamps which we entirely ignored is the clamp of Dr. John W. Holt, Fig. 1, and our short-coming led to some little correspondence between Dr. Holt and ourself. We found by this correspondence that, although we had Dr. Holt's clamps and had used them we had never been successful in the use of them for labio cervical cavities, and the reason of this was that we had not used them in the manner designed by Dr. Holt. We had always placed the forked end of the clamp over the cavity and the sharp end on the palatal surface. Dr. Holt says this is not his design. The sharp end must be placed over the cavity on the labial surface and the forked end on the palatal surface.

Fig. 1.

Since using these clamps in this way we find we have been much more successful. But in their use we do not put the dam on first and the clamp on afterwards, and stretch the dam away from the cavity to see how to apply the clamp, but we apply the clamp first. By so doing we can apply it with less pinching of the gum and see better what we are doing. We apply the *forked end* of the clamp to the palatal part of the tooth, and then let the *sharpened end* bite just above the margin of the cavity. If this end impinge a little on the gum the pain does not amount to more than a "pin stick," and passes off almost immediately. We then prepare the dam by punching three holes in it. The middle hole should be larger than the two others, as this hole is to be stretched over the clamp. By soaping the holes the dam will slip over the clamp without the least danger of being torn. Once over the clamp, the septum in the dam may be passed between the teeth and ligated to the two teeth on either side of the one to be filled. Used in this way we have found these clamps very serviceable for filling very many of this class of cavities.

A LABORATORY HINT.

By Theodore F. Chupein.

In making a band for a tooth crown, or a band to be secured to a tooth, for regulating purposes, it will be found that the ends *spring away* when removed from the root or from the tooth, and although

these may be brought together again and held in place with the tweezers, it is sometimes quite difficult to make the solder flow just where it is needed, because the band is so thin and gets heated quicker and hotter than the ends of the tweezers which holds the parts together. If, before making any attempt to solder these bands, it is held in the tweezers until it is red hot, and then let go by the tweezers, there will be no further spring, and the solder may be applied to the point where it is needed and the ends untied without difficulty.

San Francisco, Jan. 15, 1891.

To the Editor DENTAL OFFICE AND LABORATORY.

Dear Sir:—At the October meeting of the San Francisco Dental Association the enclosed resolutions were passed and the Secretary instructed to forward the same to Dr. Crouse. In acknowledging the receipt of them he requested that they be sent to the different Dental Journals for publication.

Will you please give them a place in your journal?

Fraternally yours,

CHAS. E. POST, D.D.S., Rec. Sec.

302 Stockton St.

WHEREAS, Dr. J. N. Crouse, of Chicago, Ill., the chairman of the Dental Protective Association of the United States, is personally known by the President and other members of the San Francisco Dental Association to be an honest, earnest and enthusiastic worker for the good of the profession, therefore be it

RESOLVED, That this Association endorse the methods of Dr. Crouse in conducting the Dental Protective Association and strongly urge every dentist of the Pacific Coast to become a member of said Association, and be it also

RESOLVED, That a copy of this resolution, signed by the President and Secretary, be forwarded to Dr. Crouse, with permission to insert it in each circular that he sends to this coast.

THOS. N. IGLEHART, Pres.

CHAS. E. POST, D.D.S., Rec. Sec.

VERMONT STATE DENTAL SOCIETY.

The 15th Annual Meeting of the Vt. State Dental Society will be held at the "Bates House," Rutland, Vt., Wednesday, March 18th, continuing three days. A cordial invitation is extended to all members of the profession to be present.

Rutland, Vt. THOMAS MOUND, Secretary.

VULCANIZING.

It is generally know that it is not possible to vulcanize rubber next *silver*, as the vulcanite will not harden on account of the affinity which that metal has for the sulphur which is in the rubber. This is likewise the case with *Iron* and *Steel*, from the same cause; and it is necessary, when it is desired to vulcanize in juxtaposition to these metals, to interpose a coating of tin or gold over these metals. For the information of those who may not know, we will say that this is not the case with *German Silver*, *Brass*, *Tin*, *Platinum*, *Gold*, or *Aluminum*, sulphur having no affinity for these metals, and vulcanite hardening thoroughly when next any of these metals.

PEROXIDE OF HYDROGEN AND OZONE.

THEIR ANTISEPTIC PROPERTIES.

Read before the International Medical Congress, held at Berlin, Germany, on the 7th of August, 1890. Published by *Medical News* of Philadelphia, October 25th, 1890. Pp. 416-418.

By Dr. PAUL GIBIER, *Director of the Pasteur Institute of New York.*

GENTLEMEN:

Since the discovery of Peroxide of Hydrogen by Thenard, in 1818, the therapeutical applications of this oxygenated compound seems to have been neglected both by the medical and the surgical professions; and it is only in the last twenty years that a few bacteriologists have demonstrated the germicidal potency of this chemical.

Among the most elaborate reports on the use of this compound may be mentioned those of Paul Bert and Regnard, Baldy, Pean and Larrive.

Dr. Miguel places Peroxide of Hydrogen at the head of a long list of antiseptics, and close to the silver salts.

Dr. Bouchut has demonstrated the antiseptic action of Peroxide of Hydrogen, when applied to diphtheritic exudations.

Prof. Nocart, of Alfort, attenuates the virulence of the symptomatic microbe of carbuncle, before he destroys it, by using the same antiseptic.

Dr. E. R. Squibb,[1] of Brooklyn, has also reported the satisfactory results which he obtained with Peroxide of Hydrogen in the treatment of infectious diseases.

Although the above-mentioned scientists have demonstrated by

[1] *Gaillard's Medical Journal*, March, 1889.

their experiments that Peroxide of Hydrogen is one of the most powerful destroyers of pathogenic microbes, its use in therapeutics has not been as extensive as it deserves to be.

In my opinion the reason for its not being in universal use is the difficulty of procuring it free from hurtful impurities. Another objection is the unstableness of the compound, which gives off nascent oxygen when brought in contact with organic substances.[2]

Besides the foregoing objections the surgical instruments decompose the peroxide, hence, if an operation is to be performed, the surgeon uses some other antiseptic during the procedure, and is apt to continue the application of the same antiseptic in the subsequent dressings.

Nevertheless, the satisfactory results which I have obtained at the Pasteur Institute of New York with Peroxide of Hydrogen, in the treatment of wounds resulting from deep bites, and those which I have observed at the French clinic of New York, in the treatment of phagedenic chancres, varicose ulcers, parasitic diseases of the skin, and also in the treatment of other affections caused by germs, justify me in adding my statement as to the value of the drug.

But, it is not from a clinical standpoint that I now direct attention to the antiseptic value of Peroxide of Hydrogen. What I now wish is merely to give a full report of the experiments which I have made on the effects of Peroxide of Hydrogen upon cultures of the following species of pathogenic microbes : Bacillus anthracis, bacillus pyocyaneous, the bacilli of typhoid fever, of Asiatic cholera, and of yellow fever, streptococcus pyogenes, micro bacillus prodigiosus, bacillus megaterium, and the bacillus of osteomyelitis.

The Peroxide of Hydrogen which I used was a 3.2 per cent. solution, yielding fifteen times its volume of Oxygen ; but this strength was reduced to about 1.5 per cent., corresponding to about eight volumes of Oxygen, by adding the fresh culture containing the microbe upon which I was experimenting. I have also experimented upon old cultures loaded with a large number of the spores of the bacillus anthracis. In all cases my experiments were made with a few cubic centimetres of culture in sterilized test-tubes, in order to obtain accurate results.

The destructive action of Peroxide of Hydrogen, even diluted in the above proportions, is almost instantaneous. After a contact of a few minutes, I have tried to cultivate the microbes which were sub-

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[2]The Peroxide of Hydrogen that I use is manufactured by Mr. Charles Marchand, of New York. This preparation is remarkable for its uniformity in strength, purity and stability.

mitted to the peroxide, but unsuccessfully, owing to the fact that the germs had been completely destroyed.

My next experiments were made on the hydrophobic virus in the following manner:

I mixed with sterilized water a small quantity of the medulla taken from a rabbit that had died of hydrophobia, and to this mixture added a small quantity of Peroxide of Hydrogen. Abundant effervescence took place, and, as soon as it ceased, having previously trephined a rabbit, I injected a large dose of the mixture under the dura mater. Slight effervescence immediateiy took place and lasted a few moments, but the animal was not more disturbed than when an injection of the ordinary virus is given. This rabbit is still alive, two months after the inoculation.

A second rabbit was inoculated with the same hydrophobic virus which had not been submitted to the action of the peroxide, and this animal died at the expiration of the eleventh day with the symptoms of hydrophobia.

I am now experimenting in the same manner upon the bacillus tuberculosis, and if I am not deceived in my expectation, I will be able to impart to the profession some interesting results.

It is worthy of notice that water charged, under pressure, with fifteen times its volume of pure oxygen has not the antiseptic properties of Peroxide of Hydrogen. This is due to the fact that when the peroxide is decomposed nascent oxygen separates in that most active and potent of its conditions next to the condition, or allotropic form, known as "Ozone." Therefore it is not illogical to conclude that ozone is the active element of Peroxide of Hydrogen.

Although Peroxide of Hydrogen decomposes rapidly in the presence of organic substances, I have observed that its decomposition is checked to some extent by the addition of a sufficient quantity of glycerin; such a mixture, however, cannot be kept for a long time, owing to the slow but constant formation of secondary products, having irritating properties.

Before concluding I wish to call attention to a new oxygenated compound, or rather ozonized compound, which has been recently discovered and called "Glycozone" by Mr. Marchand.

This Glycozone results from the reaction which takes place when glycerin is exposed to the action of ozone under pressure—one volume of glycerin with fifteen volumes of ozone produces Glycozone.

By submitting the bacillus anthracis, pyocyaneous, prodigiosus, and megaterium to the action of Glycozone, they were almost immediately destroyed.

I have observed that the action of Glycozone upon the typhoid fever bacillus, and some other germs, is much slower than the influence of Peroxide of Hydrogen.

In the dressing of wounds,, ulcers, etc., the antiseptic influence of Glycozone is rather slow if compared with that of Peroxide of Hydrogen, with which it may, however, be mixed at the time of using.

It has been demonstrated in Pasteur's laboratory that glycerin has no appreciable antiseptic influence upon the virus of hydrophobia; therefore I mixed the virus of hydrophobia with glycerin, and at the expiration of several weeks all the animals which I inoculated with this mixture died with the symptoms of hydrophobia.

On the contrary, when glycerin has been combined with ozone to form Glycozone, the compound destroys the hydrophobic virus almost instantaneously.

Two months ago, a rabbit was inoculated with the hydrophobic virus, which had been submitted to the action of this new compound, and the animal is still alive.

I believe that the practitioner will meet with very satisfactory results with the use of Peroxide of Hydrogen for the following reasons:

1. This chemical seems to have no injurious effect upon animal cells.

2. It has a very energetic destructive action upon vegetable cells —microbes.

3. It has no toxic properties; five cubic centimetres injected beneath the skin of a guinea-pig do not produce any serious result, and it is also harmless when given by the mouth.

As an immediate conclusion resulting from my experiments, my opinion is that Peroxide of Hydrogen should be used in the treatment of diseases caused by germs, if the microbian element is directly accessible; and it is particularly useful in the treatment of infectious diseases of the throat and mouth.

PRACTICAL PLACE.

Method of Removing Collar-Crowns.

By R. M. Sanger, D.D.S.

Sometimes it happens that "the other dentist" crowns a root which has been inadequately or improperly treated. The result is an abscess or a painful pericementitis. We wish to remove the crown. Perhaps we admit to ourselves in confidence that the crown itself is better than one which we could make. We are in a predica-

ment. From the patient's standpoint at the moment, we have the advantage. She has lost faith in "the other dentist" and has come to us. She is intelligent and fully understands that "the other dentist" is responsible for the abscess which she expects us to cure. We can cure the disease, but if we replace the crown with one of inferior (our own) make we are sure that the intelligence of the patient will be used to our disadvantage. There is but one way out of the dilemma, and that is to remove the crown so that it may be replaced. This may be done as follows:

With a sharp spear drill, lubricated with glycerine, drill through the backing at a point over the pin. If the drill is well tempered this will not be very difficult. Enlarge this hole slightly with a round burr, then with a wheel burr cut the pin free from the cap. The crown can now be worked off without mutilating the band. Next the pin remaining in the tooth root must be removed. To do this burr away the cement around it with a fine spear-pointed fissure drill, being careful not to cut the metal itself. This should be done to a depth sufficient to allow a firm grasp of the pin with the sharp-nosed pliers now supplied for bending the pins of artificial teeth Do not attempt to draw the pin out by direct force, but twist it slightly to disintegrate the cement, when it will be found that the pin will come away with little effort. You have thus succeeded in removing the crown without mutilation.

When the root has been restored to a healthy condition, replace the crown, insert a platinum and iridium pin through the opening in the backing which was drilled to release the original post. Fasten into position with hard wax, remove carefully, invest and solder.

In this way you can preserve the crown made by "the other dentist," with which no fault was found, and after the proper treatment simply reset it, with very little labor to yourself—a good fee and considerable glory.—*Dental Mirror, East Orange, N. J.*

In Soldering Bands to Plates a great saving of time is effected by using casting sand, as an embedding material, instead of sand and plaster. It is also claimed for this, that the relative position of the band to the plate is better maintained. Mix your sand with water to the consistency of cream. Place the plate, with band waxed to it, on a pumice or asbestos block. Drop the sand around band, and a little to fix plate, much as you would with plaster and sand.

The asbestos soaks up the water so that the sand "sets" almost at once. Now warm up the sand. This is most important. When

that is warm, burn the wax off. Then borax and solder.—*British Journal Dental Science.*

A Dental Anæsthetic.—The combination of cocaine and antipyrine in solution is said to act as a powerful local anæsthetic upon the gums, and also upon sensitive dentine. The anæsthesia is more lasting and more complete than when cocaine is used singly.

Dr. Martin, in *L'Union Medicale*, suggests the following formula, which he has used with great success :

℞. Hydrochlorate of cocaine......................gr. $\frac{3}{4}$
Antipyrine...gr. vj
Distilled water....................................m. xvj. M.

—*Medical News.*

RENEWING ZINC FOR DIES.

When the zinc used for dies gets thick and unsatisfactory, place it in the melting ladle and heat to dull redness, when a tablespoonful of strong hydrochloric acid thrown on it whilst stirring with a stick or an iron rod, will instantly render the zinc perfectly fluid and equal to new metal.—*Fletcher*, *Archives.*

ANSWER TO QUERY.

In *Ohio Journal*, Sept. number, p. 428. The only method which I have found to give entire satisfaction where a plate will not stay up and is continually dropping down : have patient come to your office the day his plate inclines to drop the most ; prepare a glass of cracked *ice ;* have patient to fill his mouth full of *ice* and as it melts keep repeating the process for about ten minutes, then take impression. I would recommend continuous-gum plate above all others, gold next and would not return to rubber until the last resort.

G. B. Martin, D.D.S., Indianapolis, Ind.

—*Ohio Dental Journal.*

A SECRET REVEALED.

A suspicious character is retailing in Ontario a local anæsthetic at five and ten dollars. He makes the purchaser sign an agreement to forfeit $100 if they divulge the secret. He then goes out and sells it to any other person who will buy it. Our subscribers can save their money, as we herewith give it to them : Chloral hydrate 26 grains : fluid extract belladonna, 10 drops ; sulphate atropia, 1 grain:

carbolic acid, 8 drops; muriate cocaine, 18 grains; saturated solution boracic acid, 8 drachms. Dissolve well. Then filter.—*Dominion Journal.*

To make Herbst's Obtundent, first get a saturated solution of cocaine hydrochlorate in chemically pure sulphuric acid, and add sulphuric ether to the point of saturation, allowing the excess of ether to escape by evaporation. Our experiments on sensitive dentine with Herbst's obtundent have been more successful than with any other cocaine preparation we have used. We attribute its efficacy to the combination of two or more local anesthetics in one solution. Sulphuric acid, when applied to living tissues possessing as low vitality as dentine, destroys all life as far as it penetrates; and by its chemical union with the lime-salts of the dentine, breaks down the structure sufficiently to furnish the cocaine free access to the peripheral extremities of the nerve-fibres. Whether the ether plays any important part we do not know: but it is a convenient vehicle for the other ingredients. Wherever this solution touches the enamel, effervescence occurs; showing the destructive nature of the sulphuric acid; therefore great care must be taken to protect the enamel from its contact. Whether its action on the dentine will go far enough, after the insertion of the filling, to produce deleterious effects, our experiments have been too recent to furnish the necessary observations; but we feel sufficiently uneasy on this point to use great caution. In one instance we tried it as a local anesthetic for the gums; where a wedge had to be driven high against the festoon. It whitens the gums immediately on contact, giving it the appearance of having been frozen with ether spray, destroying sensibility to pain very effectually. The difficulty of applying it to the gum without allowing contact with the enamel, nearly precludes its use here.—*Dr. L. G. Noell.*

CONES AND WHEELS FOR POLISHING.

Nice cones and wheels for the laboratory, which are much more durable and satisfactory than either felt or cork, can be made by any dentist. Turn out of good dry cotton wood the sizes and shapes you want. Then cut from good, heavy chamois skin pieces of right size and shape to cover the cones and wheels you have ready; shave down the ends of the strips thin; now coat the side going next to the wood with this cement: Glue, five parts; rosin, four parts; red ochre, two parts; mixed with the smallest possible quantity of water.

When mounted, lay in a cool, dry place till the cement is thoroughly set. If the instructions are followed, they can be used for carrying any polishing material wet with water—*Dr. W. H. Steele*, *Items*.

REFINING WASTE AMALGAM.

The question of the easiest and best method of refining amalgam scraps, either those which have been mixed up and not used, or old filling, so that they can be again utilized, is of interest to every practising dentist.

It is well known that mercury boils at 357° C, and can be driven off from amalgam by a sufficiently high heat. The other metals present are not very easily volatile, and if they can be prevented from oxidizing, should be left in a condition to again form an amalgam on the addition of mercury.

I have made some experiments in this line, and find that this result can be obtained in the following manner.

The mercury may be allowed to escape, or the process can be conducted so as to preserve it. In the former case the operation should be carried on where there is a good draught to remove the vapors of mercury so as to escape the danger of breathing them. It is only necessary to heat the scraps in a crucible until the mercury is expelled, using a flux to prevent the oxidation of the alloy. A sand crucible may be employed and a coal fire, or any heat by which it can be raised to redness.

As a flux, borax glass—borax which has been fused to drive off the water of crystalization—answers very well. The amalgam should be placed in the hot crucible in small portions so that it may not be thrown out by the sudden conversion of the mercury into vapor. Enough borax should be used to form a ring when melted around the button of alloy, and the heat must be maintained until the mass has come to a quiet fusion and the globules of mercury at first seen on the walls of the crucible have disappeared. The metal can then be poured out and the ingot reduced to the necessary fineness by any of the common methods. As a convenient means of doing this I have been accustomed to pour the mass into an unglazed porcelain mortar which has been heated so that it can hardly be held in the hand, and grinding quickly with a warm pestle. By a little practice the metal can be, by this means, reduced to a fine state. The coarser particles may be sifted out by a fine wire gauze and remelted. As some of the borax will probably remain mixed with the alloy, it is advisable to boil it a few minutes in water that this may be removed, if present.

After drying, it is ready for use. If the mercury is to be recovered, the scraps must be heated in a mercury retort or a crucible with a bent tube inserted through the cover. The mercury will distil over through this and can be condensed where there is no possibility of breathing the vapor. When as much as possible has been removed in this way the heating should be continued a short time with the crucible open in order to expel the last traces. The residue can then be treated as described above.—*E. W. Rockwood, Demonstrator of Chemistry in the Dental Department State University of Iowa.—From the International.*

A MILLION ON THE MARCH.

A generation on the march from the cradle to the grave is an instructive spectacle, and we have it carefully presented to us in a report of Dr. Darr. Let us trace the physical fortune which any million of us may expect. The number to begin with is made up of 511,745 boys and 488,255 girls, a disproportion which, by the way, will be redressed by the undue mortality of the boys, and will be reversed before the close of this strange, eventful history. More than a quarter of these children will die before they are five years old—in exact numbers 141,487 boys and 121,795 girls. The two sexes are now nearly on a level. The next five years will be much less fatal. In the succeeding five years—from ten to fifteen—the mortality will be still further reduced. Indeed, for both sexes, this is the most healthy period of life; the death rate, however, is lower for boys than girls. There will be some advance in the deaths in the next five years, and still more in the next ten to follow; but 643,045 will certainly enter on the twenty-sixth year. Before the next ten years are at an end two thirds of the women will have married. The death during that period will be 62,052, and of these no fewer than 27,134 will be caused by consumption. Between thirty-five and forty-five a still larger "death roll" will be paid, and little more than half the original band—in exact numbers 502,915—will enter on their forty-sixth year. Each succeeding decade, up to seventy-five, will now become more fatal, and the number shrink terribly. At seventy-five only 161,124 will remain to be struck down, and of these 122,559 will have perished by the eighty-fifth year of the march. The 32,565 that remain will soon lay down their burdens; but 2,153 of them will struggle on to ninety-five, and 293 to be one hundred years old. Finally, in the 108th year, the last life will flicker out. Such is the average lot of 1,000,000 men and women.

Tooth Pastes.—T. R., St. Louis.—We take from Snively's "Manufacture of Perfumes" the following recipe:

VANILLA TOOTH PASTE.

Vanilla bean	2 drs.
Cloves	½ dr.
Refined sugar	1 oz.
Prepared chalk	3 ozs.
Honey, a sufficient quantity.	

Beat the vanilla and cloves to a fine powder with the sugar, add the chalk and form a paste with the honey.

We would also suggest the following as a desirable

ROSE TOOTH PASTE.

Prepared chalk	4 ozs.
Powdered orris root	2 ozs.
Carmine, No. 40	1 dr.
Oil of rose geranium	15 mins.
Oil of sandal	5 mins.
Glycerin, a sufficient quantity.	

Rub the carmine thoroughly with a small portion of the chalk, then triturate the remaining solids together, finally adding the oils and enough glycerin to form a paste.

Another variation is to add to the foregoing an equal quantity of powdered castile soap.

Any tooth powder may be formed into a paste with honey or glycerin. When the latter is used, the mass will keep soft indefinitely.

Any pure neutral soap like castile, for instance, will answer as a tooth soap. If flavor is required, the soap must be melted, with the addition of a very little water, in a water bath, the perfume added and well stirred in, and the mass then pressed into a "frame" or moulds to dry.

Coffee in Cocaine Poisoning.

Dr. S. Mitchell reports (*Med. Rec.*) a case of cocaine poisoning from a hypodermic injection in which after the unsuccessful trial of ammonia, brandy and digitalis, both hypodermically and orally, also heat and general faradization without any apparent effect, coffee afforded prompt relief. A large cupful as prepared for the table was given within the space of a couple of minutes.

THE DANGER OF HYPNOTISM.—At Nuremburg a case of some public interest has recently been tried in the police court. A commercial traveller, while in a restaurant told the waitress to look steadily at the white of his eye, and hypnotized her. On the second occasion he repeated the experiment, but this time the sleep was so profound that a medical man had to be called, who had the utmost difficulty in rousing the girl. The commercial traveller was accordingly summoned to appear before the magistrates, and the severe sentence of eight days imprisonment was passed on him, which will probably be efficient in checking similar performances in that region. In France the practice of hypnotizing people for amusement seems to be very common, and unpleasant consequences are reported. At a supper party in Paris one of the company hypnotized a girl and was unable to rouse her. She was consequently taken to the house of a medical man. and after a time she recovered consciousness. The whole party were taken in custody by the police, and were not released till next day. Even when hypnotism has been practised by competent medical men for remedial purposes, unpleasant accidents and ulterior consequences have again and again occurred, so much so that recently an order has been issued by the French Government prohibiting surgeons in the army and navy from practising it.

TINNING OF STEEL.

The tinning of hard steel is advocated by a writer in one of the English mechanical papers, on the ground that a bath of melted tin will not injure the temper or materially soften hardened steel surfaces, the fact being that tin melts at 442 degrees and polished steel acquires straw color at 460 degrees F. In carrying out this process the iron or steel article is first freed from scale by means of a pickle of dilute sulphuric acid and the scratch brush or sand; or, if the articles are of steel and have been quenched or hardened in oil, every trace of this is first removed by immersion in a boiling soda lye and the surface made chemically clean; even the film of oxide due to a pale straw color will prevent the perfect adherence of the tin to the steel. The bath consists of one part hydrochloric acid to about twenty parts of water; in this the article is held for a few seconds by means of a pair of brazing tongs, then withdrawn, and while still wet, immersed instantly in a ladleful of melted tin, the surface of this being kept from oxidizing by a flush of good, clean tallow. Care is necessary not to overheat the tin beyond the proper melting temperature, and in less than half a minute the article, when withdrawn, is found completely tinned.—*Scientific American.*

VALUE OF SOAP FOR THE FACE.

I went once to a doctor to consult him about a slight eruption on my face, and what do you think he told me? That it was probably owing to dirt! I dirty, with my cool baths in the morning! I was furious, but when he explained himself I was forced to acknowledge that he might be right. He said: "In the first place, a good many people do not use soap on their faces, claiming that it injures the skin. Now, soap is absolutely necessary to remove the exudations of the skin, and the face certainly has more of these than the hands, and good castile soap will not hurt any face. Then most of you fill a basin with water, soap yourself, wash and rinse in it. Why, don't you see you are washing in the dirt you are trying to remove? And very litle of it does come off, but, mingled with soapsuds, stays on to dry and irritate the skin. The way to do is to soap and wash yourself in the first basinful, rinse out your washrag, then in a fresh basinful wash without soap and rinse in still a third water. By this time you will be really clean. Clothes are never fresh and white, no matter how well washed, if they are not rinsed. Better one such washing a day than half a dozen smears. And never wash just before being exposed to the air."

I went home and thought the matter over. The advice was all I had for my three dollar visit, and I finally concluded that I might as well take it. In a week there was a decided difference, and people began to remark the improvement in my complexion. The first few trials left me as if I had been flayed, but the skin gradually gained the silky texture peculiar to babies. I told a number of women of this simple remedy, and it never failed in any case to do good.—*Interview in New York Herald.*

MORTUARY GOLD.

The French scientist, Mr. Victor Mennier, as the result of careful inquiries, asserts that the American dentists insert in American teeth, each year, the enormous amount of 800 kilogrammes (about 1,800 pounds) of the precious metal, which represents nearly $450,000. This gold is never recovered, of course, but is buried with the person in whose mouth it is placed. Making allowance for the rapid increase of the population of the United States and for the continued deterioration of American teeth, it appears that in less than one hundred years the American cemeteries will contain a larger amount of gold than now exists in France.—*Scientific American.*

APPARATUS FOR PRODUCING ARTIFICIAL RESPIRATION

A simple, cheap and efficient apparatus for this purpose, says the *British and Colonial Druggist*, may consist "simply of a pair of bellows of proper size, a few feet of india rubber tubing, a face mask, and two sizes of intubation tubes. There should also be set in the tubing a double tube, with opening similar to that commonly found in the tracheal canula of the physiological laboratory, so that it is in the power of the operator to allow for the escape of any excess of air thrown by the bellows. This whole apparatus can be prepared at a very trifling expense, and it seems hardly necessary to point out its probable value in various narcotic poisonings, and other accidents, in which death is produced by a paralysis of the respiratory centers of temporary nature. The proper use of it—at least with the face mask—could be taught to persons without special medical skill, so that it not only ought to form a part of the surgeon's outfit, but might also be of great service in life-saving stations, about gas works, etc."

A NEW METHOD OF PRODUCING LOCAL ANÆSTHESIA.

Dr. Voituriez, recommends in the *Moniteur Therapeutique*, a method of producing local anæsthesia which certainly possesses the merit of simplicity. It is based upon the "well-known anæsthetic properties of carbonic oxide," and consists in pouring on the place to be anæsthetized the contents of two or three bottles of seltzer water, preferably by means of the siphon, which releases the water in a strong stream. The anæsthesia lasts five minutes and then gradually disappears. It is difficult to see how the "well-known anæsthetic properties" of the oxide are exerted by external application. The effect, if any, is probably mechanical.

PROGRESSIVE KNOWLEDGE.

Some one says: At ten years of age a boy thinks his father knows a great deal, at fifteen he knows as much as his father, at twenty he knows twice as much, at thirty he is willing to take his advice, at forty he begins to think his father knows something, after all, at fifty he begins to seek his advice, and at sixty—after his father is dead—he thinks he was the smartest man that ever lived.

To cure a felon, says a correspondent, mix equal parts of strong ammonia and water, and hold your finger in it for fifteen minutes.

After that withdraw it and tie a piece of cloth completely saturated with the mixture around the felon and keep it there till dry.

DIET OF OLD PEOPLE.

As we increase in age—when we have spent, say, our first half-century—less activity and energy remain, and less expenditure can be made; less power to eliminate is possible at fifty than at thirty, still less at sixty and upward. Less nutriment, therefore, says Sir Henry Thompson, must be then taken in proportion as age advances, or rather as activity diminishes, or the individual will suffer. If he continue to consume the same abundant breakfast, substantial lunches, and heavy dinners which at the summit of his power he could dispose of almost with impunity, he will in time certainly either accumulate fat, or become acquainted with gout or rheumatism, or show signs of unhealthy deposit of some kind in some part of the body—processes which must inevitably poison, undermine or shorten his remaining term of life. He must reduce his "intake," because a small expenditure is an enforced condition of existence.—*New York Ledger.*

AN OBSERVANT YOUTH.

"I had to be away from school yesterday," said Tommy.

"You must bring an excuse," said the teacher.

"Who from?"

"Your father."

"He ain't no good at makin' excuses. Ma catches him every time." —*N. Y. Sun.*

THERE was an old man who said "Fools,
I'll put down your railroads and schools!"
So he got in the way of the engine one day,
But the train did not stop—nor the schools.

SWEET CHARITY.

JOHNNY.—Please, Pa, let me have a quarter to give to a poor, lame man.

PA.—Who is the poor, lame man, Johnny?

JOHNNY.—Er–well, Pa, he's the ticket seller down at the circus.—*West Shore.*

IF YOU MUST DRINK.

If a man must drink the best thing he can take with his meals is a

little claret or light Rhine wine, and if he wants something a little stronger, Scotch whiskey with water is the best thing he can have. The habit of taking a drink early in the morning—a cocktail or stimulant of that kind commonly called an eye-opener, is one of the worst things that can be done. The effect of alcohol is to inflame the stomach, and it will do this even when diluted, and will do so greatly more when taken on an empty stomach, early in the morning. The best drink that a man can possibly take is milk. Milk, though, is hardly a drink. One can live longer on it than on any one thing. Milk is more nearly a perfect food than anything. It contains more elements that go to build up the system than any other article. Early in the morning the best drink to take is water. Tea and coffee drunk in moderation will not hurt anybody, although they are both stimulants. —*Medical Record.*

VOLTS, OHMS AND AMPERES.

We condense the following interesting definition of those oft-used but little understood, electrical terms, from a recent number of the *Locomotive*:

The volt is the unit used in estimating electrical pressures. An ordinary Damell's cell is capable of giving an electrical pressure of almost exactly one volt. Edison dynamos give about 110 volts, the Westinghouse about 1,000. The word volt is from the name of an early Italian experimenter, Volta.

Ohm. This is the unit of electrical resistance. A wire of pure copper, .056 of an inch in diameter and 100 yards long, offers one ohm resistance to an electrical current. The word ohm comes from the name of a German electrician, G. S. Ohm.

Ampere. Some currents of electricity are stronger than others, and it is customary to compare them with a standard current called an *ampere.* This is a current of electricity of sufficient strength to decompose 5¼ grains of water per hour. The word comes from Ampere, the name of a French electrician.—*Exchange.*

CITY AND COUNTRY.

There is practically no disease, with the exception of typhoid and malarial fevers, which does not claim a larger number of deaths in the large cities than in the country (*i. e.*, smaller towns, villages, and sparsely settled regions). Take consumption, for instance, and diseases of the nervous system. Out of every 100,000 of population in rural districts, 160 persons die of consumption. In diseases of the nervous

system the figures are respectively 225 for the city and 150 for the country. These data give a very good general idea of the increased risk of living in large cities. In reality, probably very few people are acquainted with these facts, or if they are, very few would be influenced by them in the choice of a home. And yet, when we take up our abode in a great city like New York, how deliberately we increase the number of factors which are constantly conspiring to shorten our lives. We nearly double our chance of dying of consumption, and increase by seventy-five per cent. the likelihood of acquiring some fatal nervous disorder. It would prove interesting reading if the intricate web of causes which produce such results could be unravelled—whether of poverty or tenement crowding, alcoholism, dissipation, the excitement of speculation or business reverses, and to each its position of relative importance could be assigned.

CEMENTS OF RUBBER AND GUTTA PERCHA.

In making a cement, one should know pretty thoroughly, says the *Rubber World*, what is to be expected of it before they could advise upon it. For instance, an ordinary rubber cement will hold on a host of different surfaces and with the best of success, except where there is continued dampness. For holding to damp walls, or surfaces where there is a constant presence of moisture, there is nothing equal to Jeffry's marine glue, the formula for which has been published and republished all over the world. It consists of:

1 part india rubber..
12 parts coal tar............... ....
2 parts asphaltum...... ....

The rubber after having been massed is dissolved in the undistilled coal tar, and the asphaltum is then added. This glue, as its name indicates, is oftentimes used for mending articles at sea, or patches, for instance, that are to be laid on surfaces that are to be under water, and it has been found to be a most excellent thing. Of glass cements there are a great many, rubber as a rule being dissolved in some very volatile solvent and some hard drying gum is added.

A gutta percha cement for leather is obtained by mixing the following. It is used hot. Gutta percha, 100 parts; black pitch or asphaltum, 100 parts; oil of turpentine, 15 parts. An elastic gutta percha cement especially useful for attaching the soles of boots and shoes, as on account of its great elasticity it is not liable to break or crack when bent. To make it adhere tightly the surface of the leather is slightly roughened. It is prepared as follows: By dissolving 10

parts of gutta percha in 100 parts of benzine. The clear solution from this is then poured into another bottle containing 100 parts of linseed oil varnish, and well shaken together.

Good rubber cement for sheet rubber, or for attaching rubber material of any description or shape to metal, may be made by softening and dissolving shellac in ten times its weight of water of ammonia. A transparent mass is thus obtained, which, after keeping three or four weeks, becomes liquid, and may be used without requiring heat. When applied it will be found to soften the rubber, but when the ammonia is evaporated it forms a kind of hard coat, and causes it to be become both impervious to gases as well as liquids.

Davy's universal cement is made by melting 4 parts of common pitch with 4 parts of gutta percha in an iron vessel and mixing well. It must be kept solid, under water, or in a dry hard state.

A very adhesive cement, especially adapted for leather driving belts, is made by taking bisulphide of carbon, 10 parts, oil of turpentine, 1 part, and dissolving in this sufficient gutta percha to form a paste. The manner of using this cement is to remove any grease that may be present in the leather by placing on the leather a piece of rag and then rubbing it over with a hot iron. The rag thus absorbs the grease, and the two pieces are then roughened and the cement lightly spread on. The two pieces are then joined, and subjected till dry to a slight pressure.

A solution of gutta percha for shoemakers is made by taking pieces of waste gutta percha, first prepared by soaking in boiling water till soft. It is then cut into small pieces and placed in a vessel and covered with coal tar oil. It is then tightly corked to prevent evaporation, and allowed to stand for twenty-four hours. It is then melted by standing in hot water till perfectly fluid, and well stirred. Before using it must be warmed as before, by standing in hot water.

A cement for uniting India rubber is composed as follows: 100 parts of finely chopped rubber, 15 parts of resin, 10 parts of shellac; these are dissolved in bisulphate of carbon.

Another India rubber cement is made of: 15 grains of India rubber, 2 ounces of chloroform, 4 drachms of mastic; first mix the India rubber and chloroform together, and when dissolved the mastic is added in powder. It is then allowed to stand by for a week or two before using.

Cement for sticking on leather patches and for attaching rubber soles to boots and shoes is prepared from virgin or native India rubber, by cutting it into small pieces or else shredding it up; a bottle is filled with this to about one-tenth of its capacity, benzine is then

poured on till about three parts full, but be certain that the benzine is free from oil. It is then kept till thoroughly dissolved and of a thick consistency. If it turns out too thick or thin, suitable quantities must be added of either material to make as required.

An elastic cement is made by mixing together and allowing to dissolve the following: 4 ounces of bisulphide of carbon, 1 ounce of fine India rubber, 2 drachms of isinglass, $\frac{1}{2}$ ounce of gutta percha. This cement is used for cementing leather and rubber, and when to be used the leather is roughened and a thin coat of the cement is applied. It is allowed to completely dry, then the two surfaces to be joined are warmed and then placed together and allowed to dry.

Cement used for repairing holes in rubber boots and shoes is made of the following solution: 1. Caoutchouc 10 parts, chloroform 280 parts. This is simply prepared by allowing the caoutchouc to dissolve in the chloroform. 2. Caoutchouc 10 parts, resin 4 parts, gum turpentine 40 parts. For this solution the caoutchouc is shaved into small pieces and melted up with the resin, the turpentine is then added, and all is then dissolved in the oil of turpentine. The two solutions are then mixed together to repair the shoe with this cement. First wash the hole over with it, then a piece of linen dipped in it is placed over it; as soon as the linen adheres to the sole, the cement is then applied as thickly as required.

TO CLEAN NICKEL.

It is said that the bluish or greenish oxidation forming on nickel, can be entirely removed by plunging the piece for ten or fifteen seconds in a mixture of 50 parts of alcohol and 1 part by volume, of sulphuric acid. Take it out, rinse in water, throw it for a moment in pure alcohol, and dry with a fine cloth or sawdust.

BOOK NOTICES.

Dental Surgery: including special anatomy and pathology. A manual for students and practitioners. By Henry Sewill, M.R.C.S., L.D.S., Eng., Past President of the Odentological Society of Great Britain: formerly dentist of the West London Hospital. *Third Edition.* With two hundred and six illustrations. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut street. 1890.

The popularity of this work has resulted in its going through *three editions* in a short time. The size is acceptable, being, as its title infers, "a manual." It must be regarded as an elementary treatise, yet the subjects are treated so concisely, that the author

gets in much information in a few words. The chapters on "Histology" and the "development" of the teeth are particularly explicit and well written, exhibiting these subjects in a very clear, lucid and explanatory manner, which, being also embelished with many new engravings, makes this, "pons asinorum," to many readers, particularly comprehensible. As a dental manual we commend the book to the profession. Ed.

The Latin Grammar of Pharmacy and Medicine. By D. H. Robinsin, Ph. D., Professor of Latin Language and Literature, University of Kansas. With an introduction by L. E. Sayre, Ph. G., Professor of Pharmacy in, and Dean of, Departments of Pharmacy, University of Kansas. Philadelphia. P. Blakiston, Son &. Co., No. 1012 Walnut street. 1890.

It has always been conceded that the knowledge of the Latin language, with its explanatory terminology, is a necessary requirement to the education of the student who takes up the profession of medicine, pharmacy, &c. The work, which is here offered to such students, is peculiarly fitted for such, as all the examples present only such words as occur in the compounding or writing of prescriptions. It is one more step in the insistance to broader education, to those who present for graduation in these callings; and a step too which simplifies and elucidates, that, without such a work, makes the rugged road to learning more even and straighter. Ed.

Descriptive Anatomy of the Human Teeth. By G. V. Black, M.D., D.D.S. Published by the Wilmington Dental Manufacturing Co., 1413 Filbert street, Philadelphia, Pa. Copyrighted 1890, by the Wilmington Dental M'f'g. Co., Phila.

Any work that bears the authorship of Dr. Black is read and received with favor. His style is so plain, eloquent and explanatory; so free from all ambiguity, that the reader is led from one chapter "of dry stuff" to another, with the fascination of a romance.

Dr. Black's description of the human teeth contains much which with many was left to the imagination of readers, and left thus with doubt. He names every little point, groove, sulcus, eminence, ridge, &c., &c., so that writers may indicate without the least equivocation exactly what they wish to infer. He desires to establish a system of terms, so that each may know with certainty what the other writes about. The work shows an immense amount of labor and detail in the effort to establish a definite nomenclature. Ed.

THE

Dental Office and Laboratory.

FOURTH SERIES.

VOL. 5. PHILADELPHIA, MAY, 1891. No. 3.

SEVENTH PAPER ON

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

(Continued from Page 39, Vol. 5, No. 2.)

EXAMINATION OF THE TEETH.

To make an examination of the mouth for the purpose of ascertaining the amount of decay there may be in the teeth, the operator should stand on the right side of his chair and patient. He should have a mouth mirror, like Fig. 118, and exploring instruments like Fig. 119. Dipping the mouth mirror in a clean tumbler of clean water, he should wipe it on a clean mouth napkin before beginning the examination. Beginning on the right side in the upper jaw, he should examine the buccal faces of the molars and bicuspids, going regularly around to the left side. Should he discover any decay in these surfaces, he should make a note of it on his diagram, Fig 120. The masticating surfaces of the teeth should then be examined in the same way, from one side of the mouth to the other, both with the aid of the mouth mirror, Fig. 118, and the exploring needles, Fig. 119, and any decayed places that are detected noted on the diagram, Fig. 120. Should there be any accumulation of tartar on the buccal surfaces of the molars, this should be removed with the proper scalers, so that a thorough examination may be made. The proximate surfaces of all the teeth should next be made, going from tooth to tooth, from one side of the mouth to the other. If there is a suspicion of decay without an actual certainty, the teeth should be forced apart with a separator, so that a more thorough examination be made. Each decay detected should be recorded on the diagram, Fig. 120. The palatal surfaces of the teeth are then examined, and a record made of these decays should there be any. In examining the proximate surfaces, it is well to pass waxed dental floss between all the teeth, which often aids in revealing decays or roughened spots

(which doubtless will result in decay), by the fraying of the floss The same procedure is made for the lower teeth, going from tooth to tooth and from side to side on all their surfaces.

SEPARATING THE TEETH.

FIG. 118.

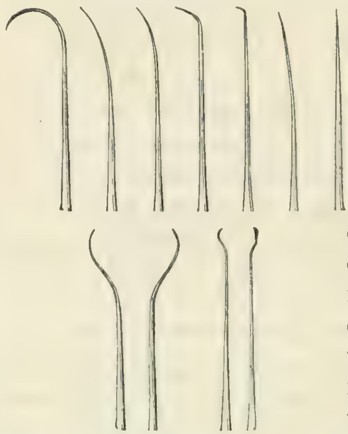


FIG. 119.

In order to detect decay on the proximate surfaces of the teeth, it is often necessary to separate the teeth to be satisfied of its existence. It is true that certain indications point to its presence, yet these are not infallible signs. Rubber, cotton, wood and tape were, and are still, used for this purpose, but since the introduction of the separators, of which we illustrated several in the September number of last year, the tedious and often painful manner of separating the teeth with these substances, is almost entirely superseded. What required from 12 to 24 hours to

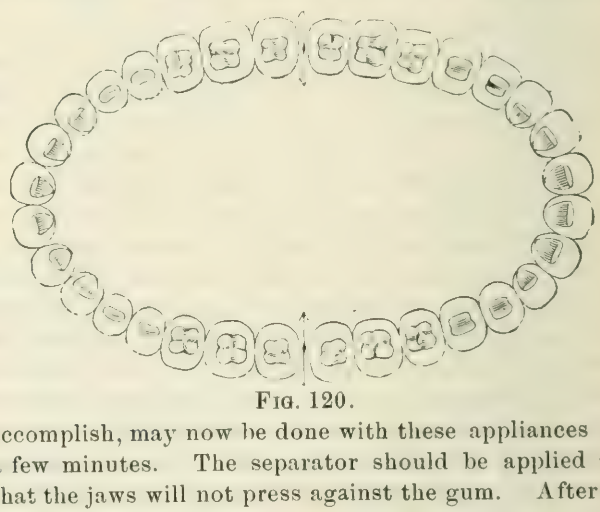


FIG. 120.

accomplish, may now be done with these appliances in a few minutes. The separator should be applied so that the jaws will not press against the gum. After it is tightened, the pressure should be applied for a minute, when it should cease for two or three minutes,

when the screws may be turned again until pain is felt, when the pressure should again cease and this procedure continued until sufficient space is obtained. Pressure should never be exerted to such an extent as to obtain a space of the one-sixteenth of an inch; but a space that will admit the passage of a No. 6 separating file is ample for all purposes, and often less space than this will be found sufficient. When decay is detected on the proximate surfaces of the incisors, the palatal surfaces of these teeth may be cut away with chisels, so as not to mutilate the labial surfaces, and to make what is known as self-cleansing spaces, such as is shown by Fig. 121. In this way the cavities are well revealed and easily filled and polished, when, after the operation, the teeth are permitted to fall back in their natural position.

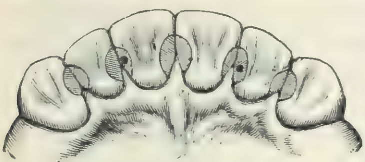


FIG. 121.

MANNER OF APPLYING THE RUBBER DAM.

Before making any attempt to do this, waxed floss silk should be drawn between the teeth, through which the septum of rubber is to pass. If the silk passes through freely, the rubber will pass also; but if the silk is cut or frayed in passing any of the spaces, the sharp edges of the decay must first be made smooth, either with a thin separating file or with a thin corundim disk. Even if the decay is so pronounced that there is no difficulty in passing a silk ligature or even a coarse twine between the teeth, the sharp edges of decay must be made smooth, otherwise the rubber will be cut in passing it over the teeth, and a constant oozing or leaking of the saliva around such places will result. It is necessary also to remove all adherent tartar around the teeth, for as this generally adheres to the necks of the teeth, it will offer an impediment to the proper application of the dam.

We will suppose a case where decay is found on the distal surface of the right superior first molar tooth. In such a case we would take a piece of rubber dam, five inches wide by eight inches long, and into it punch four holes in the same relation as is shown in Fig. 122.

A right upper molar clamp, such as is shown by Fig. 123, is tried on the second molar to ascertain if it fit the tooth snugly. Removing it from the tooth, the jaws of the clamp are passed through the hole in the dam, designed to fit over the second molar, as shown by Fig. 124. The clamp forceps are applied to the bow of the clamp, and the

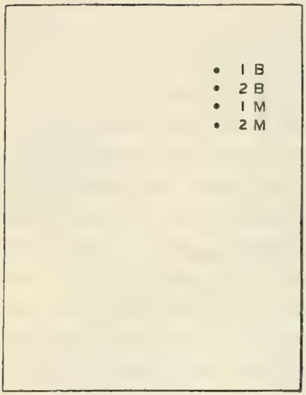


Fig. 122.

dam is gathered up over the beaks or ends of the forceps, so as not to impede the sight in the application of the clamp to the tooth. When the clamp is affixed securely to the tooth the dam is stretched over the jaws of the clamp with a small ball burnisher, like Fig. 125, so that the dam will hug the tooth. The dam is then stretched forward so that the holes designed to pass over the first molar and the two bicuspids will find their places. The septum between each hole is made to pass between the teeth, either by the use of waxed floss silk or by insinuating a burnisher, like Fig. 126, pressing the teeth apart with this, until the rubber slips down to the neck of the tooth. This is done with each septum of rubber, until each tooth is embraced by the rubber through the hole designed for it. A knot is now tied in the ligature, such as is shown by Fig. 40 (in the July No. for 1890), and the silk passed around the tooth so that the knot will lie on palatal aspect of the tooth. The tooth is tied with the ligature, with a double knot, like Fig. 40. Before making the second tie, the ends of the ligature are drawn forward with the fingers of the left hand, the forearm resting on the head of the patient, while with an instrument like Fig. 127, in the right hand, pressing the knot on the palatal surface, the dam is forced upward, carrying it up well on to the neck of the tooth. Each tooth is ligated in the same way. If the second molar to which the clamp was applied, is *not* a very short or a very conical tooth, from which the dam would be liable to slip, this too, for the comfort of the patient, may be ligated. To do this, a large knot is made in the ligature. The ligature is passed behind the bow of the clamp between it and the third molar. The operator must be certain that the ligature *snaps through* while passing between the teeth so as to be sure that it is below (or above) the point of contact of the teeth. The large knot should rest on the

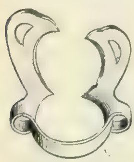


Fig. 123.

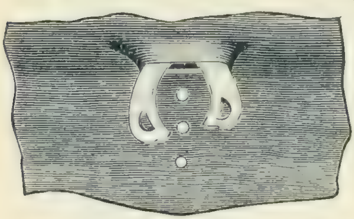


Fig. 124.


Fig. 125.

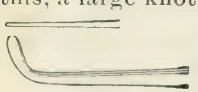


Fig. 126.

palatal aspect, the other end of the ligature should pass beneath the jaws of the clamp and between the first and second molar. The ends

FIG. 127.

are then tied with a knot like Fig. 40, and are drawn forward as in the other cases. The clamp may be carefully lifted off the tooth, the slack in the ligature taken up, so that the knot will lie close to the tooth, after which the second knot is made. Several ties may be made, if thought necessary, so that there will be a knot around this tooth, both on the palatal as well as on the buccal surface; because the dam is more apt to be pulled away from this tooth than from the others. If there be any

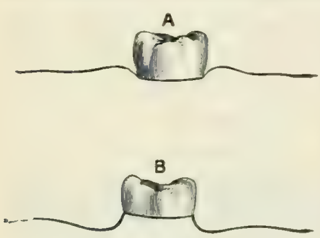
FIG. 128.

doubt as to the shape of the tooth, or as to the possibility of the dam being pulled off in the course of the operation of filling, it would be better to let the clamp remain on until the operation is completed. In Fig. 128 is shown the dam applied to the teeth as has been described, showing also the rubber dam holder, for keeping the dam out of the way of the operator, as also the two clamps which hold a napkin next to the chin and face of the patient, greatly contributing to his comfort.

To apply the dam to the lower teeth we proceed in very much the same way. The first procedure is the passing of the waxed silk between the teeth. If this is cut or frayed the sharp edges of the decayed places must be made smooth, either with a separating file or with a corrundum disk in the dental engine. This being done, all adherent tartar about the teeth, particularly that next the necks of the teeth, should be removed with proper scalers. A clamp such as is shown at Fig. 129 is then tried on the tooth, to see that it fits the tooth snugly and does not move about. It is then removed, and the jaws passed through the holes of a piece of

rubber dam in the same way as shown by Fig. 124. The clamp forceps are then passed into the bow of the clamp, and the dam is gathered up over the ends of the forceps, so that the operator may see how to apply the clamp to the tooth. When the clamp is applied to the tooth, the dam is caught on one side, next the cheek, with the rubber dam holder, and the strap passed around the head of the patient. The other side of the dam is then caught with the other end of the dam holder, when the strap is tightened with the small slide on the back of the strap behind the patient's head. The dam is then stretched beneath the jaws of the clamp with a ball burnisher, like Fig. 125, first on the buccal surface and next on the lingual. The rubber is then stretched forward so that the two bicuspids will be also enclosed by it. The septum of rubber is made to pass between the teeth either by pressing the teeth apart with a brunisher, like Fig. 126, or by means of the waxed dental floss. By passing the dam over three or four teeth, the operator is enabled to work and see what he is doing better. The rubber must be made to embrace the *necks of the teeth*, and to do this the waxed floss should be passed between the teeth and tied with a knot on the lingual surface, and afterwards with a double tie like Fig. 40, so that by holding the ends of the ligature with the fingers of the left hand, and applying an instrument like Fig. 127 on the knot, on the lingual surface, the dam is carried well down on the neck of the tooth. Not only is this accomplished, but by this manipulation it is made to curl downward like Fig. 130 A, and not lie upward like Fig. 130 B. Each of the teeth should be tied in the manner we have set forth. The clamp will cause no discomfort if the operator is provided with a saliva ejector, by which the mouth is freed of accumulating saliva; but if he is not so provided, he will contribute greatly to the comfort of his patient if he can remove the clamp from the tooth, for in doing this the patient is enabled to close his mouth and *swallow the saliva* from time to time as it accumulates, and thereby relieve himself of much discomfort. It will also greatly add to his comfort by placing a napkin, doubled several times, next the chin beneath the dam, instead of permitting the rubber to lie next the skin. In order to remove the clamp, a large knot should be made in the ligature; the ligature is passed behind the bow of the clamp, and the rubber insin-


FIG. 129.



FIGS. 130 A. B.

uated through, between the first and second molars, the other end of the ligature is passed through between the first molar and second bicuspid, a knot like Fig. 40 is made in the ligature. The large knot is to lie on the lingual surface *beneath the jaw of the clamp* and the double knot (Fig. 40) on the buccal surface also beneath the outer jaw of the clamp. The ligature is then drawn tight and the double knot tied tight to the tooth. The ends of the ligature are held with the fingers of the left hand, and with the clamp forceps in the right hand the clamp is carefully lifted off. When the clamp is lifted off, it will be found that although the ligature was drawn tight against the tooth, there will be considerable slackness in it. This slackness must be taken up so that the ligature will lie close to the tooth, after which the second tie may be made. It is well, for security sake, to tie the ligature a half dozen times on the buccal surface of the tooth, so that there will be a large knot both on the buccal as well as on the lingual surface of the tooth. These knots serve as shoulders to prevent the dam being pulled off. Fig. 131 shows what we have attempted to describe, and Fig. 132 shows the application of the dam to the teeth in the patient's mouth.

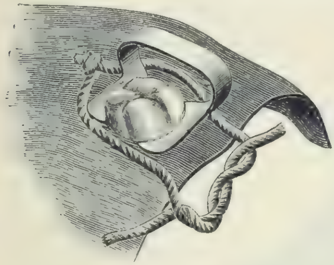


FIG. 131.

FIG. 132.

For applying the rubber dam over any of the ten upper teeth clamps are seldom necessary. We seldom apply the dam without embracing *at least three teeth*, and often we cover five and six with it. An advantage is thereby gained in giving the operator a better view of his work, and the patient in allowing these teeth to get dry, when, should there

be more than one cavity to fill, the cavities are rendered almost painless from the effect of dehydration. In very short broad teeth, it may be necessary, as an aid to apply a clamp to one of the bicuspids, the better to start the application of the dam ; but once it is applied to two or three teeth the clamp may be removed, and the dam equally as well secured to the teeth. The mode of application for any of the ten upper teeth will be same as the manner already described. The knot in the ligature and the double tie will be found invaluable in the application.

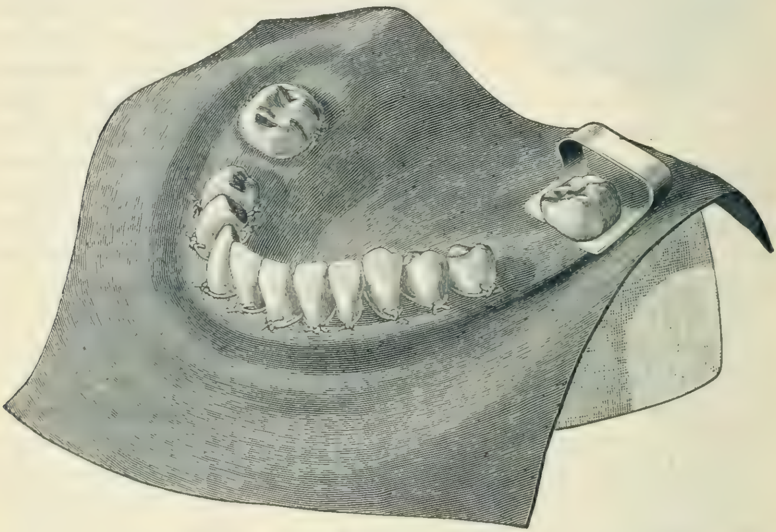


FIG. 133.

For the ten lower teeth the same manipulation has to be observed, a clamp being always used to aid the operator in the application. Fig. 133 illustrates how the dam is applied over all the lower teeth, whether for the purpose of making a close examination for the detection of decay, whether for the thorough cleansing of the teeth of all adherent tartar, or for the preparing such cavities of decay in the teeth as may need filling.

DARK JOINTS.

BY BENJ. I. HILL, E. Akron, O.

It seems as if dark joints will ever be the cry. I have used the plan I give below for some time, and never have a discolored joint. After the case is waxed up, remove every other block and perfectly clean every joint of all wax or other matter. Mix a quantity of hard

setting cement quite thin, and spread some on the whole length of the joints of each block taken off, drawing the spatula from the inside edge outside, so as to leave the larger quantity on the inner half of the joint. Place the blocks in position and after the cement has set, invest in the usual way. Allow the flasks to stand over night or at least five or six hours. This is a success.

BLACK RUBBER.

By T. F. Chupein.

We would give a word of advice to those who have to use black rubber for dentures:

Black rubber, in our experience, is more apt to be porous in the process of vulcanizing than vulcanite colored with other pigments. This seems to be the case whether the plate be *thick* or *thin*. We have vulcanized black rubber next to pink, light red, extra tough, maroon, mottled red, dark red, crimson orange, &c., and in *every case*, while the other samples were perfectly vulcanized, the black rubber was porous. To overcome this tendency, we proceed as follows: We apply the heat until the thermometer reaches 220 degrees, then we decrease the heat, and let the mercury rise, gradually, to 300 degrees in *one hour*. We then keep it at 300 degrees for *one and a half hours*. This keep the case in the vulcanizer a little over two and a half hours.

[EDITORIAL.]

MODELLING COMPOUND.

The *Archives* has not come to hand for some time past, and, it was only in looking over a recent number received, we noticed that Dr. Staples had remarked our strictures on "Modelling Compound." The doctor is facetious when he says we "jumped upon him with both feet," and he has made quite *an impression* on us by his pleasant tone.

As far as old-fogy notions are concerned, modelling compound is more old fogy than plaster. For what are wax, gutta percha, and modelling compound for taking impressions, but one and the same thing? The shortcomings of one are the shortcomings of the other, and, it was only with the desire to remedy these shortcomings that plaster has been introduced.

There is not a dentist who would not sooner take an impression with modelling compound, than take one with plaster: and there is not a patient who does not abominate plaster. Yet it stands to

reason, that if we find teeth standing in every contrary position, it is impossible, with materials like wax, modelling compound or gutta percha, to obtain a correct impression.

While we hold out for plaster in the majority of cases, we hold too, that very many may be successfully taken with modelling compound. Indeed, we know that we have failed with plaster impressions sometimes, and have succeeded with modelling compound.

Now, while we " render unto Cæsar, the things which are Cæsar's, &c., &c., &c.," and while the doctor, from his emphatic words, has given so much of his thought to taking impressions with modelling compound and is able to perform impossibilities with it, we move that the doctor for the benefit of the profession at large, write a paper on taking impressions with modelling compound, entering into every minute detail, so that the ignorant (like ourselves on this subject, and plaster of Paris cranks like ourselves), may learn, for we all want to improve and adopt that which is best.

We cheerfully accord the doctor our pages, and trust that both he with his article, and we with our journal, may benefit each and every member of our profession, in our search for, and acceptance of, the " eclectic." ED.

ELECTRICITY IN DENTAL OPERATIONS.

BY L. BURGOYNE PILLIN, L. D. S., ENG

At the dinner of the past and present students of the National Dental Hospital and College, on the 21st ultimo, the President, Dr. B. W. Richardson, mentioned most favorably the new dental vibrator, and a perfectly painless operation he witnessed me perform on the morning of that day.

As the introduction of this method of extraction must necessarily be of interest to my professional brethren, the following brief explanation and few facts may not be unacceptable :

The invention was introduced into this country by Dr. Babcock, of Maine, U. S. A., in August last. It is proprietory, being the monopoly of a company which has patented it all over the commercial world, the English patent being in the hands of an eminent firm of engineers in the city of London. It consists of a direct current derived from a small Rhumkorff coil, made of extremely fine wire—about a mile, I am informed, of No. 40 B. wg.—with a very delicate and highly strung armature, strained by a clamp and screw at either end, giving it sensibility and immense rapidity. The energy is derived from a two-cell battery of the ordinary bichromate form, the

poles being formed of *compressed* zinc and carbon. In consequence of the high tension of the armature spring the titillations are so quick that the vibratory broken sound is lost, and is resolved into a special note, that note being *tuned* to the philharmonic orchestral "A"—*ergo*, 452 vibrations to the second of time. These vibrations are conveyed to two electrodes—negative and positive, *the positive pole being divided*, presenting in appearance what at first sight seems to be a *third* pole or terminal, which practically is impossible. For the operation of tooth extraction the *modus operandi* is as follows: The patient being adjusted in the chair to the best advantage for the operator, with regard to light, height, angle, &c., the negative electrode is taken in his or her left hand, the positive in the right, and the current allowed to run gently for a few moments; it is then increased till it becomes somewhat unpleasant, when it is immediately cut off by a switch governed by the operator's foot. The cable from the *apparent third pole* is then attached to the forceps, and everything advanced as much as possible for the extraction. The subject is then impressed with the importance of holding well on to the electrodes. All being right the current is then let on and the extraction proceeded with in the ordinary way; no hurry need be exercised, as the patient will feel nothing of the luxation of the tooth, or any pain whatever. Immediately on removal of tooth the switch is re-applied with foot and the matter is at an end, and a painless operation the result. The high initial tension of the electric current is so rapid, and the deflection of the third contact so great that no sensibility is felt in the part operated on.

My experience, since taking the matter up, and after exhaustive experiments, is most satisfactory—of nearly 250 extractions (up to time of writing) not a single failure has occurred. The only semblance of anything untoward, was that of a young woman, in a highly hysterical condition at the time, who relinquished the hold of the negative electrode the moment I told her to hold on. This was witnessed by two celebrated hospital surgeons, who of course agreed that it was no failure of the instrument or its application. One lady, after having five stumps removed by this method, insisted on having ten more extracted, and afterwards assured her husband and me that nothing but "pins and needles" in the hands was felt.

The effect is not that of an anæsthetic or an annulgent, but an extremely rapid divertant, and its utmost power less than *one volt*—a quantity so insignificant as to be perfectly harmless. As before stated, the instrument and its working is a patent, and before long will be before the profession.

TAKING IMPRESSIONS.

In the construction of artificial dentures it is certain that a true impression is of prime importance. To get an exact copy of the human mouth is by no means an easy matter.

The different conditions that make the situation are often so adverse that we are frequently tempted to give up our efforts and say let the cheap dentist take the trouble and gather in the shekels and the glory. The mode of procedure which I shall suggest to you will, I think, lessen somewhat the difficulties of operation and help to give more exact results. The material for taking the impression should be of such a nature as not to press out of position any of the parts of the mouth of which we desire to obtain a copy. This is at variance with the teachings of some eminent operators, but I think it is more exact to take the impression truthfully and then carve it and model to suit the condition revealed by a careful examination of the mouth. After the material has taken an impress of the parts, there should be absolutely no change possible in the removal, for if there is your impression is untruthful, and you have no means of knowing its extent nor the power to correct it. In my judgment there is but one material known to us to day which meets the requirements of the two principles which I have named, and that is plaster of paris. If of proper consistency and rightly manipulated, it will not displace the softest parts, but will truthfully take their impress. In the removal it does not bend out of shape by slightly adhering to the roof of the mouth, nor draw into straight lines, as the wax compounds will always do to a greater or less extent; but as it cannot bend, it breaks with a sharp, clean fracture, which leaves exact edges to be rejoined. For these reasons I always use plaster of paris for all kinds of impressions.

In describing my process we will begin with a partial upper case. The first step is to get a wax impression with the teeth as nearly correct as may be. In this, cast a plaster model, using salt or potash to hasten the setting, and separating as soon as set, for the heat generated by the quick setting will have so softened the wax as to render the separation easy. In this model place a sheet of wax, and have it cover all portions corresponding with the parts of the mouth of which you wish a copy. Let the wax cover the palatine surfaces of the plaster teeth, but not the grinding surfaces. In the spaces between the teeth let the wax be quite thick. On this wax plate place a piece of ordinary wire mosquito netting, which carefully adapt so that it covers and touches the wax and the grinding surfaces of teeth. Next, in the usual way, coat with separating fluid (I use pure glycerine) the

parts of the model not covered with the wax, and place a coat of plaster over the wax and net, being sure that it covers the grinding surfaces of the teeth and a narrow space at the back of the wax plate. When this has hardened, separate and remove the wax and you will have a shell of plaster stiffened and held firmly by the wire net. This shell closely approximates the shape of the mouth, and will carry the plaster of your impression to just the part you wish to copy and nowhere else. When you are ready to take the impression, try the shell in the mouth and trim till it goes easily into place and rests firmly on the ends of the teeth. Then soak it in water to make it more comfortable to the mucous membranes, and also that the impression plaster may stick to it. Next fill the shell with plaster mixed in the usual way, and place in the mouth, pressing up until it rests on the ends of the teeth. You will find that the plaster, while flowing easily and accurately to all parts inside the arch, will not be on the outside of the teeth, and consequently it will be quite easy to remove the impression by pressing down on the two sides of the shell. For a full upper cast you take an impression in wax, being careful to have the wax press as high as possible on the gum. By at once casting a model and hastening its setting, you can retain your patient till the model can be compared with the mouth. Mark on the model the places where the edges of the shell can rest firmly. Then construct the shell in the same way as for partial cases letting it go as high as possible on the gum. In taking the impression you simply press up till the shell rests firmly on the parts intended, and the plaster flows inside the shell and is not disturbed by any tremor or movement of the hand of the operator.

In removing the impression it will be necessary to lift and draw the side of the mouth so as to admit air between the impression and the roof of the mouth, when it will easily drop.

Partial lower impressions have always been a matter of great trouble to me and I believe to others, especially where there is much undercut, where the teeth lean in a good deal, or both together. It is only within a day or two that I have been able to think out an adaptation of this system to such cases, and it is still largely a matter of theory. I will give you my ideas on the subject, so that we can all work at it and perhaps obtain something that will be of general benefit.

In such a case, after getting a model of the lower jaw from a wax impression, I should trim to as close an approximation of the mouth as possible and then prepare the shell in the same way as for a partial upper, excepting that I should leave a portion of the wire net just back of the front teeth uncovered by plaster for a space of perhaps a

quarter of an inch in width, and extending from the cutting-edges of the teeth down to the floor of the mouth. This forms a hinge which will allow the free ends of the shell to be pressed toward the tongue, and so make it easy to carry the plaster down over the crowns of projecting teeth. When down to its place, dress the sides of the shell laterally against the teeth and hold till the plaster is set. Of course, by this time the plaster of the impression covering the hinge has also set and made that portion rigid. If, now, you can easily remove the shell and its contents, do so. If not, again press inwardly the free ends of the shell till the plaster over the hinge is broken and the sides are clear of the teeth, then remove, and by pressing the shell outwardly till the fractured edges are touching, the impression is restored to its truthful position.

In my hands this system of taking impressions has given uniformly good results, and I hope that you may find in it sufficient merit to work it out and improve still further upon what I have suggested. The wire netting has a valued place in my laboratory. I use it in making trial-places, putting it between two thin sheets of wax, which it makes very stiff.

In mending or in making slender plaster work, a piece imbedded is a great strengthener, and even if the plaster breaks the parts do not part. There are two grades, fine and coarse, which gives a variety suitable for different conditions.—*Dr. Horace Dean.*

ADHESION vs ATMOSPHERIC PRESSURE.

By Sylvestor Moyer, D. D. S., L. D. S., Galt., Ont.

Dr. E. A. Teskey's article in the July number of the *Dominion Dental Journal*, under the above heading, resolves itself into: Can a vacuum be formed by the use of an air-chamber? To this Dr. Teskey replies: "I think I am safe in asserting that under the conditions imposed it is impossible to create a vacuum by withdrawing the air, or any part of it, from the ordinary air-chamber."

Certainly, if no vacuum be formed, all must agree that the air-chamber becomes a detriment; but if, as I maintain, part of the air can be withdrawn and withheld, there must be additional pressure added to the opposite surface of the plate, resulting in a more perfect adaptation to the tissues of the palate, thus still further increasing the retentive force. This needs no further remark, for Dr. Teskey undoubtedly agrees with my conclusions.

But why should there be any disagreement on the possibility of evacuating an air-chamber when the proof is so easy and convenient?

Why does not Dr. Teskey do as many others as well as myself have done, experiment on his own mouth? Let him make two plates for it without teeth, and which do not come in contact with his own teeth; the one with, and the other without, an air chamber. If he will try them both impartially, he will find that a vacuum can be formed on the one to such an extent (it is my experience) that the resultant pressure upon the tissues will be painful. Until he has made this test, he will not be in a position to decide upon the practical utility of the one method over the other, especially since his contentions are not based upon scientific principles. "Nature abhors a vacuum," and who can not cause a thimble to remain in contact with the tongue, by withdrawing part of the air?

His article also contains several other statements which, to my mind, are contrary to the experience of the great majority of dentists.

Adhesion, he says, holds together two pieces of glass when wet and in contact. If he will put them in a chamber, and evacuate the air, he will find that with the atmospheric pressure, adhesion also vanishes, and the pieces fall apart.

"What practical man," he says, "will not tell you that the greater the area of the horizontal surface (other things being equal), the more retaining force is exhibited?" He appears to mean that a perfectly flat palate will more easily retain an artificial denture than a very high and narrow arch. I can scarcely believe that that is his meaning. But he again expresses a similar idea when he says, "Why is it that V shaped arches exhibit little retaining force?" If such be the case in his experience, it must be because he does not employ an air-chamber. Other dentists report a different experience.

"Why," he asks, "do artificial dentures exhibit greater retaining force on soft than on hard palates?" In using air-chambers this is true only when a plate is first put up into position, and before it has been pressed into intimate contact with the tissues, and is due to the unyielding nature of the tissues, making it more difficult to evacuate the air-chamber. But when Dr. Teskey says sufficient air can get in to establish an equilibrium, I can merely say that, theoretically, his conclusions are wrong, and, practically, he draws upon his imagination for his facts.

Again, he says: "Why does a plate exhibit a retaining force without an air-chamber?" The answer of the "Adhesion theory" given by him is certainly very incomplete. As far as he goes, I believe all dentists will agree with him, because he merely gives the conditions. Has the other theory no answer? What an insinuation! Did ever a reputable dentist claim that plates without air-chambers exhibit no retaining

force? Surely not; and surely Dr. Teskey should know it. All who use and know the benefits of air chambers claim nothing more for them than that they increase the retentive force that already exists by increasing the external pressure, and in conjunction, making the adaptation more nearly perfect and thus still more retentive.

He asks why it is "that the retaining force does not cease when the tissues enlarge and fill the vacuum. Certainly, because from the intimate contact of the other parts of the plate with the tissues, and more or less from the contact of the chamber with the enlarged tissues that fill it, the air is precluded, and the atmospheric pressure to a greater or less extent prevents the plate from withdrawing from the palate. But why, if there is no suction, do the tissues enlarge and fill the air-chamber?

To his last question, "Why is it that V shaped arches exhibit little retaining force?" I can merely reply as before, because an air chamber is not used. I never heard such an idea advanced, and Dr. Teskey's answer to the question is quite as amusing. He appears to labor under the impression that gravitation is not constant; that the weight of the plate depends upon the curvature of the arch, for he says: "It is because gravity is exerted at right angles to a very limited space."

In conclusion, I must take exception to his substitution of the word "adhesion" for the word "suction." It may be more euphonious, and when used in its proper sense, less vulgar; so are many other words that would be even more inappropriate than adhesion. But is vulcanite really so very adhesive? Will it show any tendency to stick to the tongue, or to the internal or external surface of the lips or cheek, or to mucous membrane in any position or form? Will it adhere to anything that is not in itself adhesive? Try again, Dr. Teskey, and until you have found a more appropriate word than "adhesion," drop the "vulgar" word "suction," and conclude that, whether or not an air-chamber is employed, the plate is held in place by atmospheric pressure.

ELECTRICITY A FACTOR IN CAPITAL.

"No enterprise in the world," said a well-known electrician, "has increased within the last few years as rapidly as the business of electric lighting. The amount of money invested in electric light plants in this country to day is $120,000,000, and it was only eleven years ago, you remember, that the light was first perfected. From the few lamps burned by Edison at Menlo Park, in 1879, there have grown

into present use at least 125,000 arc lights, and 1,700,000 incandescent lights."

One of the most noticeable results of this remarkable growth, says *Electric Power*, is the increase in the price of platinum. Here is an incandescent lamp. You see the short strip of wire attached to the copper conductor just at the top of the globe. Well, that is platinum. It connects the carbonized loop, and is one of the absolutely indispensable features of the lamp, because it expands at the same temperature and in the same proportion as the glass globe. There have been a good many experiments for the purpose of determining a substitute for platinum, but none has been found, the experiments resulting in each instance in the unequal expansion of the metal and the glass, and the consequent breaking of the globe. Unfortunately, every lamp requires a strip of this metal. I say "unfortunately" because it has come to be extremely valuable, and the mines are not productive. Moreover, they are situated in the Ural Mountains and are practically inaccessible. As a result of this increasing demand and diminishing supply, the price of platinum has advanced tremendously; it is now almost as valuable as gold. Five years ago the metal was seldom used in this country, being employed only in the evaporating stills for the concentration of sulphuric acid and in the manufacture of jewelry. It was then to be bought in the market for $3 and $5 an ounce. A year ago it advanced to $8 an ounce, six months ago it had increased to $14, and I see by one of the trade journals that it is now gone up to $20, which is only a few cents less than to-day's gold quotation.

Platinum gets its name from the Spaniards. As early as the sixteenth century it appears to have been noticed that the gold ore in the Spanish mines of Darien included grains of a white metal endowed with the qualities of a noble metal, and yet distinctly different from silver. Its exportation to Europe was prohibited, because the Spanish government found that it might easily be used in the adulteration of gold. For this reason it did not find its way to Europe until the middle of the last century, when it was known as "platina del Pinto"—the little silver from the river Pinto. Since its remarkable chemical properties were established in 1780, it has been discovered in New Granada, San Domingo, California, Borneo, and in portions of Canada. But the richest deposits are those in the Ural Mountains, where the metal was discovered in 1823, and where it has been successfully mined by the Russians since 1828.—*Scientific American.*

It is evident, that *Electric Power*, was not posted as to *all* the uses

of platinum; and one to which it was and has been largely applied. In the manufacture of mineral teeth, platinum was the metal found most serviceable for the pins or rivets used therein, both on account of its ductility and malleability, as on account of its high state of fusion, this metal resisting the great heat necessary to fuse the mineral elements, of which the teeth were made. In an experience of *Thirty Years*, we never knew the price to be as low as it is quoted above. For a few months during the "sixties" it fell as low as $4.28 per ounce, but soon it rose to $5. From this price it never fell, but rose to $6, and for many years averaged from $7 to $7.50 per ounce, until the tremendous advance of a year ago. O. L.

ON COCAINE AS EMPLOYED IN DENTISTRY.

Few articles have been so much written about of late years as cocaine. By his discovery of its anæsthetic properties, the young Vienna physician, Dr. Koller, did incalculable service to suffering humanity. All the more, therefore, is it to be regretted, that some persons by gross exaggeration of trifling occurrences in the application of the drug should seek to discredit so valuable a remedy, and after probably irrational modes of experiment, assert rash opinions likely to deter timid operators from employing cocaine.

Cocaine injected in solution of quite minimal strength, say 0.2 to 0.4 grain into the gums is perfectly innoxious. Not every tooth can, indeed, be extracted without causing pain, even with help of cocaine, yet it does so far yield relief that most patients declare the operation to have occasioned very little suffering. To employ cocaine rightly, one must first of all clearly understand its influence as an anæsthetic. This is strictly local. In injecting cocaine, only the tissues immediately surrounding the tooth to be removed should be permeated by the solution, and it should not be allowed to penetrate further, since otherwise it is liable to become absorbed by the blood vessels, enters the circulation, and in large doses produces very serious effects.

Formerly I used to employ a 10 per cent. solution of cocaine, but soon perceived that this was too strong, and during the last three years have found a 5 per cent. solution to meet all requirements. A 5 per cent. solution I prepare as follows: I have always a stock of Boehringer's Cocaine in tubes containing each ¼ gramme (= 3.8 grains). When the solution is needed, the contents of one such tube is introduced into an empty 5 gramme vial (it generally holds about 6 grammes = abt. 92 grains) which is then filled with distilled water containing 1 per cent. of carbolic acid solution. In this way I

get a solution of Cocaine of about 5 per cent. strength, the slight addition of carbolic acid enabling the solution to keep the better. The 5 gramme vial suffices to fill a Pravaz glass syringe five times; a full syringe contains therefore about 0.77 grain of hydrochlorate of cocaine. Half a syringeful injected is sufficient to produce in course of 5 to 10 minutes an adequate anæsthesia.

When a tooth is to be extracted, the cocaine solution should previously be well rubbed into the surrounding gums. In doing so, the cotton wool must not be moistened to excess, or the solution will flow into the mouth which should be avoided.

The Pravaz syringe is now half charged, and beginning at the collar of the tooth, is introduced along the roots on the labial side. The canule is now turned in order to produce a small aperture, or sac, into which the solution is injected till the tissues surrounding the roots change color. This pallor is of course only transitory, and disappears directly the cocaine has become absorbed by the gums and porous alveole. Before the canule is withdrawn, the gums should, if possible, be gently rubbed to increase the power of absorption. If in withdrawing the canule, part of the solution should escape, the patient should be requested to rinse his mouth out. A similar injection is then carried out on the lingual or palatinal side of the tooth. In most cases one will find that a $\frac{1}{4}$ syringe = 0.192 grain of cocaine hydrochlorate suffices. I never inject more than half a syringe.

After injection one should wait five to ten minutes. The forceps, previously of course most carefully purified and disinfected, should be dipped into hot water so as to be warmed to at least blood-heat. If with injections of cocaine of such minimal strength, any disagreeable results nevertheless follow, these are by no means symptoms of poisoning, but simply attacks of fainting, to which the patient would have been subject without the injection of cocaine. The fainting of patients is always an unpleasant incident, but cannot be avoided. There are patients only too strongly inclined to faint. Probably every one of my professional brethren knows dozens of such cases. I therefore avoid employing injections of cocaine when fainting is to be apprehended, that is, with my timid patients, or those whose dread of the extraction of a tooth has caused them sleepless nights, and whose nerves are consequently shaken. If I do give such patients cocaine, it is only after administering a stimulant. That does not, indeed, prevent their fainting, but somewhat promotes the activity of the heart. Employed with proper knowledge and care in minimal doses of 0.190 to 0.385 grain, cocaine is unquestionably one

of the safest of drugs, and has the further advantage of being so cheap, that we can give the poorest patients the benefit of it, since even if we receive no payment at all, 0.385 grain of cocaine costs only about a halfpenny. The favorable opinion of the Prague professors concerning Boehringer's Hydrochlorate of Cocaine I can fully confirm.

THE PRACTICAL PLACE.

SENSITIVE DENTINE.

A pledget of cotton, well saturated with pure carbolic acid, sealed into the cavity with Fletcher's artificial dentine (which, by the way, is incomparably superior to either wax, gutta percha, or phosphate for inclosing applications), and left for two to four days, will usually have a magical effect in obtunding sensitive dentine. The application may be made in a minute and removed in five seconds, while the removal of a phosphate filling is often anything but a pleasant task for both patient and operator.—*W. D. Miller, M. D., D.D.S. in Cosmos.*

THE ANTRUM OF HIGHMORE.

There are various methods of perforating the antrum, and it is desirable of course, to enter it at a point corresponding, if possible, to its lowest level, to facilitate drainage. In a case recently I punctured the antrum with a large drill through the palatal arch at a point corresponding to the extremity of the palatal root of the first molar. This afforded free drainage, and gave me the opportunity to explore and medicate the antrum, which resulted in the entire cure of one of the most extensive cases of disease I ever met with.—*Dr. Dwinelle, in the Cosmos.*

COMBINATION OF CEMENT WITH AMALGAM.

We mix the amalgam in the usual manner, avoiding an excess of mercury, whereas the cement (phosphate of zinc) is mixed perhaps slightly thinner than usual; the two are then thoroughly incorporated by means of a stiff spatula. The amount of amalgam used is, in bulk, about one-third to one-half of the cement. The material may be prepared by simply dropping the amalgam already mixed into the liquid of the phosphate cement and then incorporating enough powder to make a stiff paste. The filling is inserted in the same manner as a simple cement filling.

The experience of this combination has not yet been sufficiently extensive to admit of forming a definite opinion as to its value. It

is claimed for it that it possesses adhesive properties equal to or nearly equal to those of the phosphate cement alone, that it is sufficiently hard to resist the action of mastication (of this there can be no doubt), and, which is of greater importance, that it is not altered by the action of the oral fluids to any appreciable extent.

It is well worth a trial.

I have found it in two cases particularly serviceable in setting pivot teeth with very short pivots, when cement alone had utterly failed.—*Ibid.*

Aristol.

This new antiseptic is taking great favor as a substitute for Iodoform in the treatment of putrescent pulps. Like Iodoform it is readily dissolved in sulphuric ether, but unlike it, it is devoid of odor. In the treatment of diseased pulps it may be pumped into the canal in its etheral solution, by means of a probe, wrapped with a few threads of cotton. The drug is then readily precipitated, as the menstrum evaporates, when it adheres to the walls of the root canals, and thus effects its healing and antiseptic properties. Dr. I. V. Kejzlar suggests its use for fistulous places or tracks, by forming it with ten parts of cocoa butter and one part of aristol, into small rods, which are used in such plans with the view of healing and of inducing fresh healthy granulations.

Aristol is a fine yellowish red powder, which adheres very readily to the skin or surfaces of wounds or burns. It is insoluble in water and glycerine, and very sparingly in alcohol, but is very easily soluble in ether and chloroform. The ether solution is precipitated by the addition of alcohol. Aristol is very freely soluble in fatty oils and in vaseline. The solution must be made in the cold, by stirring, as the use of heat causes a decomposition. For the same reason it is necessary to protect the body from light and keep it in opaque bottles.

The value of Aristol can scarcely be overestimated, as it is a drug possessing the good properties of iodoform, but free from its toxic effects and any suspicious odor. This will be appreciated both by physician and patient.

Aristol is obtainable of any reputable druggist or Dental Supply Co.

W. H. Schieffelin & Co., New York.

TO CONTROL OCCLUSION.

The difficulty in this operation is to obtain a natural articulation.

Our text-books give us no end of rules: "Drop the patient's head as far back as possible;" "Tell him to swallow;" "Tell him to touch his back teeth;" "Don't tell him to bite back, or he will surely bite forward," etc.

My plan is as follows: For instance, in a full upper case I place the trial-plate and wax rim in the mouth ready for the imprint of the inferior teeth, then I simply place the tip of my forefinger at the front of the wax rim about where the lower teeth will touch, and ask the patient to close his mouth slowly. When the inferior teeth touch my finger I make the request, "Don't bite my finger, but bite back of it." At once, if he has bitten forward, the jaw jumps back like a machine. As the teeth approach the wax I gradually manipulate out my finger. I have tried this plan in over thirty cases with entire success.—*Harold Clark*, *Toronto*, *Cosmos.*

MATRICES.

The mica matrix is furthermore useful in operative dentistry, for the reception of any of the plastic filling-materials; and for these purposes its nature, pliability, and extreme thinness admirably adapt it.—*R. Walter Star*, *D.D.S.*, *in the Cosmos.*

PYOKTANIN.

Dr. W. H. Atkinson regards this new antiseptic most highly. The yellow is to be preferred. The stain left by it may be removed with hydrochloric acid and water 10 to 90—respectively. It should be used with great caution.

THE SNOW METHOD.

How many who heard Dr. Snow discuss his new method of vulcanizing, and saw his results, have tested the matter in practice? Very few, we take it, though no one doubted for a moment the soundness of the teaching. We have tested the method, and found it effective. This is an application of knowledge that has a dollars and cents value, for which reason alone the practical should employ it.

For the benefit of those not familiar with the method through Dr. Snow's papers, we summarize as follows:

1. Flask as usual, cutting a channel, say a quarter or three-eighths of an inch from the mould, with gates leading from mould to channel.

2. Pack with rubber as usual, closing the flask perfectly and keep-

ing it so until the rubber has finished its creeping (say five minutes).

3. Loosen the bolts until to rattle.

4. Place the flask in the vulcanizer, raise to the vulcanizing point, and hold there not to exceed thirty minutes.

5. Shut off the heat, but do not let off the steam. This last would be ruinous to the contents of the loosely-bolted flask.

6. When the guage indicates zero, open the vulcanizer, close the flask perfectly, return to the vulcanizer, and finish the process of vulcanizing.

7. Result: Vulcanite in close apposition with teeth and model, and later no complaints on the part of the wearer of foul taste and odor.—*Odontographic Journal.*

SELF-MADE MEN.

Christopher Columbus was the son of a weaver, and also a weaver himself. Claude Loraine was bred a pastry cook. Cervantes was a common soldier. Homer was the son of a farmer. Demosthenes was the son of a cutler. Oliver Cromwell was the son of a brewer. Howard was an apprentice to a grocer. Franklin was a journeyman printer and son of a tallow chandler and soap boiler. Daniel Defoe was a hosier and son of a butcher. Cardinal Wolsey was the son of a butcher. Lucian was the son of a maker of statuary. Virgil was the son of a porter. Horace was the son of a shopkeeper. Shakespeare was the son of a wool stapler. Milton was the son of a money scrivener. Pope was the son of a merchant. Robert Burns was the son of a plowman in Ayrshire.—*Exchange.*

Nothing, however, is said of the son of a gun.

SAFE CORROSIVE SUBLIMATE FORMULA.

In small quantities for dental purposes, corrosive sublimate, $1\frac{1}{2}$ gr.; chlorhydric acid, 1 drop; aniline blue to color; water, 1 oz.

HYALINE.

A "horny translucent, plastic composition of great tensile strength and considerable elasticity, which may be as a cheap and inodorous substitute for celluloid, and can be worked, dyed, pressed, denitrated, and rendered incombustible or fire-proof." "Hyaline" is a mixture of about equal parts of gun-cotton and colophony, or shellac, copal, dammar, turpentine, or of any mixture of these resins.—*F. Eckstein, Plastic Compositions.*

EXTRACT OF HAMMAMELAS FOR THE GUM.—A patient who had lost all his upper and most of his lower teeth from Riggs' disease, and for which he had been treated by a noted dentist, has arrested further loss by the use of "Pond's Extract," simply rinsing the mouth daily with the clear extract. His gums are now in perfect condition. It was recommended to him by a friend who had used it for the same purpose.—*L. P. Haskell.*

PHYSICAL DEVELOPMENT OF CHILDREN.

Dr. Axel Key, of Stockholm, read a very interesting paper before the recent Medical Congress, Berlin, on the development of puberty and its relation to morbid phenomena among school children. In Denmark and Sweden it has been the custom for many years to weigh and measure the school children every year. Out of fifteen thousand boys and three thousand girls the results were as follows: "In the seventh or eighth year of life boys grow considerably in height and in weight, after which a delay sets in which reaches its maximum in the tenth year and lasts till the fourteenth year, when a considerable acceleration of growth suddenly sets in. This acceleration lasts till the end of the seventeenth year. Its maximum is in the fifteenth year. The acceleration is at first in height and later on in weight, gaining its maximum in the latter in the sixteenth year. At the end of the nineteenth year bodily development of youth seems to end. In girls the course of development is quite different. The decrease in growth after the eighth year is not so great as in boys and yields in the twelfth year to a rapid increase in height. The acceleration in the increase in weight comes later, but outstrips it in the fourteenth year. In the seventeenth or eighteenth year the increase is but slight. The increase in weight, however, sinks to zero almost in the twentieth year, when the growth in women may be regarded as ended." A remarkable thing, as pointed out by Dr. Key, is that boys grow faster than girls in weight and height till the eleventh year, then more slowly till the sixteenth, and then faster again. With slight variation these relations obtain all over Sweden and Denmark. In Italy and the United States of America the period of puberty in girls ends at least a year earlier. "In the spring and summer the child grows more in height, while in the autumn and winter it increases more in weight." "How is it now with the health of school children during the development of puberty? It was found that forty per cent. of the fifteen thousand boys in the high schools in Sweden were ill; that fourteen per cent. suffer from habitual headache, thir-

teen per cent. from chlorosis." "We ought," he concluded, "to adapt our demands on the youthful organism to its strength and power of resistance during the various phases of development, to promote the health and vigorous bodily development of youth better than we do now. I therefore indorse, from the bottom of my heart, the words which Johann Petter Frank, the father of school hygiene, uttered a hundred years ago: 'Spare their fiber still, spare the forces of their minds, do not waste the energies of the future man in the child.' "

EPILEPSY CURED BY THE EXTRACTION OF A TOOTH.

Dr. Siebert reports a case in which suffering two years from epileptic attacks, was always preceded by a peculiar movement of the tongue. After the extraction of a painful decayed lower molar, the peculiar feeling of the tongue was no longer observed, though the patient suffered during four months from the frequent occurrence of the attacks which then ceased. Two years later, the attacks had not returned. In a second case, epileptic dizziness existed about four months, and the fully developed epileptic state thirty eight days. Here also loss of control of the tongue preceded the attacks, which ceased altogether after a decayed, but not painful, upper molar had been removed. The author advises in all cases in which the patient remembers nothing but the initial vertigo to inquire into the condition of the teeth.

POSTAL EXPENSES.

The estimates sent to the Treasury for the next fiscal year, for railroad transportation alone, for the mails, cover $22,610,128.31.

CURIOSITIES OF THE DEAD LETTER OFFICE.

Letters go astray by the foolish manner which intimates sign them; as for example, "Mother," "Jack," "Your affectionate Sister," &c., leaving the clerks no means of returning such letters to the writers. About 319,000 of all letters opened, contained valuable inclosures, either of money, negotiable paper, postage stamps or miscellaneous papers and articles. The money inclosures alone amounted to over $40,000, and those representing negotiable paper to over $1,400,000.—*Report of the Postmaster-General.*

PATE DENTIFRICE.—Precipitated chalk, 150 parts; powdered white soap, 150 parts; powdered orris root, 50 parts; carmine, 2 parts; oil

of peppermint, 15 parts; oil of cinnamon, 25 parts; glycerine, a sufficiency.

Dissolve the carmine in a little solution of ammonia, and mix it well with the chalk and orris root, then add the soap and the essential oils, mixing the whole thoroughly in a mortar, and sifting to ensure thorough division of the oils and the coloring matter. When this is done return the powder to the mortar, and make into a hardish mass with glycerine. The mass is now to be formed into cakes, and may be put up in tiny porcelain jars.

DAGUERREOTYPISTS AND CONSUMPTION.

C. L. Lochman, of Bethlehem, Pa., writes to *Anthony's Photographic Bulletin*, asking old daguerreotypists to communicate with him in regard to any experience or knowledge they may have in regard to the matter indicated by the following passages of his communication: "The announcement of Dr. Koch's alleged discovery for the cure of tuberculosis, stirred the whole civilized world to a high degree of excitement, showing that anything on which a hope of cure for that scourge of humanity can be placed, is received with the liveliest interest. My experience leads me to believe that the vapors developed by the iodine, bromine and mercury in the dark room, as formerly used by the daguerreotypists, forming iodide and bromide of mercury in a nascent state, together with the uncombined vapors of the iodine and bromine, proved curative in incipient consumption. This method of cure can be rationally based upon the destructive influence on the tuberculous bacteria by the above agents."

SLEEPING IN THE WOODS.

At one of the German health resorts (*Allgem. med. Central-Zeit*), the experiment was tried last summer of having the patients with pulmonary disorders, sleep all night in the open air in the pine woods. The hammocks used to rest in during the day were provided with pillows and bed clothing, and a party of five, two ladies and three gentlemen, spent their nights in the woods with no roof over their heads. The experiment was very successful; the patients slept better than they had been able to do in their rooms, and all declared themselves as feeling much more refreshed by their sleep than usual. It is proposed next summer to provide accommodation for a large number of patients in the forest, so that the experiment may be tried on a large scale.

GUTTA PERCHA COMPOSITION.

The following method of preparing gutta percha so as to make it a suitable material for shoe-soles and other articles requiring extra durability, has been patented in England. The gutta percha having been softened by heat, iron filings are mixed with it, and it is then rolled flat and molded, while still warm, into the required shapes.

PLASTER IMPRESSIONS.

I have never heard of any one using my methods of preparing plaster so as to avoid the adhesion of the plaster to the teeth. The adhesion is due to the great affinity of the plaster for water, and unless that affinity is perfectly satisfied in the adding of water to the plaster in making the mixture, it will absorb every bit of the lustre from the teeth and then cause an adhesion. The first point then is that the plaster shall be thoroughly mixed. Have a large quantity of water—all that it would take up—and then wait long enough for the union to be complete; that is one point. The next point is that I would add to the plaster from one-third to one-half of pulverized pumice, according to the strength of the plaster. Some plaster would not take more than one-half, while others would take two-thirds of pulverized pumice; then it requires less water and the adhesion to the teeth is almost entirely prevented, and you get your impression out of the mouth with less liability to fracture.—*L. C. Ingersoll.*

DR. ATKINSON says, "The accumulation of saliva should always be swallowed, never expectorated.

I APPROVE of the use of carbolic soap as a cleansing medium for childrens' teeth.

I RECOMMEND creosote and oil of cloves, equal parts, with which to wash out every cavity that you excavate, before filling. The purpose in using the mixture is to get the modified effects of the two, in preference to the action following the administration of either alone.

FITTING BANDS TO ROOTS.

For securing the measure of roots, an instrument can be used shaped like a pair of small pliers, the point of each half being split and having a ring upon it, forming a miniature clamp. A piece of tagger's tin is cut about the desired length, and wide enough to rise a trifle above the end of the root. The jaws of the pliers are clamped upon this, and by compressing the handles, the tin is drawn

around the root and the measure quickly and accurately obtained. Gold crowns are too well understood to need more than passing notice. My own preference in constructing them is, on the score of strength and simplicity, to *cast* the cusps, then fit and solder the band.—*Dr. G. W. Dennis, Ill. So. Review.*

CAMPHOR A SOLVENT FOR IODOFORM.—Camphor increases the solubility of iodoform in alcohol and ether. While one hundred parts of alcohol ordinarily dissolve not more than one and one-fourth parts of iodoform, the same amount of a saturated solution of camphor is capable of taking up as much as ten parts.—*Dental Register.*

ANÆSTHESIA IN SMALL OPERATIONS.

For this purpose Dr. A. Dobisch, of Zwittau, recommends spraying the parts for one minute with the following: Chloroform, 10, ether, 15, menthol, 1. This produces complete anæsthesia of the skin, lasting from two to six minutes.—*Journal American Medical Association.*

TO GET A GOOD BITE.—After properly trimming the wax models, place them in the mouth, and place the right hand on the back of the neck and the left on the forehead, and force the head as far back as possible, holding the neck stiff with the right hand, when it will be difficult for the patient to throw the lower jaw too far forward, and the closure will be natural.

W. N. MURPHY, D. D. S.

La Grange, Texas.

THE clean surfaces of pure gold will weld without the aid of heat, and if the welding property is destroyed by accidental moisture or impurities, it can be restored partially without the aid of heat, by washing the surface with chloroform.

THOMAS FLETCHER.

DR. CATCHING suggests covering the top of your operating-table with heavy white paper, over which lay a good plate of glass, with a raised molding around the edge. This is easily kept bright and clean and your points are plainly visible.

TO REMOVE DARK STAINS FROM THE TEETH.—Many of you have often despaired, doubtless, of removing dark stain from the teeth of

some of your patients. The next time such a case confronts you, add a drop or two of aromatic sulphuric acid to your paste of pumice and water, and continue using the soft rubber disk loaded with this mixture, and the stain disappears as if by magic. Floss silk charged with this preparation, is a simple yet effective means of removing stains from between the teeth.—*Dr. A. W. Candless.*

M. Morelette, a well-known French scientist, states that vulcanized rubber dipped suddenly into boiling glycerine, takes the character of non-vulcanized rubber, *i. e.*, that its parts can readily be joined, and that it dissolves in the usual solvents of caoutchouc. The glycerine must be boiling at the time of first contact.

ANTIFEBRIN.

At the time I took up this, six months ago, it was quite new to me. My attention was called to it by a physician who was using it very largely in neuralgia. In my opinion, we have no remedy which approaches this agent in value. I have used it in fifty cases, and in forty-five of them have been successful—that is, in reducing within a few hours the pain of advanced periodontitis.

I cannot give you accurate details, because I could not carry the record as far as I wished, but, in my experience, it is superior to the local application of either aconite or iodine.

I always confine my treatment to two doses of ten grains each, and the pain is almost immediately relieved, and there are no ill-effects from it, as from the use of opiates. I took up the use of another substance, phenacetin, a medicine of like character, but the antifebrin has been most successful.—*Dr. Elliott, in the International Dental Journal.*

GASOLINE BLOW-PIPE.

Mr. J. J. Reed, writing in the *International Dental Journal*, says: The blow pipe consists of a quart bottle with a mouth about one inch in diameter, fitted with a rubber stopper, the latter perforated by two holes, through which pass two glass tubes, one extending nearly to the bottom of the bottle, the other merely passing through the stopper. Two rubber tubes, about four feet long, are attached to the glass tubes. To the end of one of these is inserted two inches of glass tubing to serve as a mouth-piece, and to the other the ordinary mouth blow-pipe. The bottle is half filled with gasoline. By blow

ing through the mouth-piece tube, which should be attached to the tube extending to the bottom of the bottle, the air is made to combine with the volatile properties of the gasoline and passes out through the blow-pipe tube and may be ignited by an ordinary alcohol lamp. It produces an intense heat. If it is desired to increase the size of the flame, all that is necessary is to use blow-pipes of varying apertures from one-eighth inch down. Care should be used not to blow in the wrong tube, as this would force the gasoline out of the other tube. A foot blower will be found of advantage.

TO REPAIR PLASTER MODELS.

An excellent and quick way to mend broken plaster casts and impressions is to paint the broken surfaces over two or three times with a very thick shellac varnish, and at each application to burn out the alcohol over a flame. When the shellac is sufficiently soft, press the parts together and hold in position till cool. It will be as strong as it was before broken.—*Scientific American.*

ALCOHOL AS AN ANTISEPTIC.

It is the antiseptic *par excellence* for instruments, as it can be used without soiling, burning or scenting the hands. Burs and files can be cleaned with it, and in operating below the gum, I always dip the point of my instrument into a little that I have poured into one of the wells of my porcelain slabs as I work, and often the points of excavators and burs. In excavating, the slight amount that adheres to the point of the instrument need not be wiped off. Those who prefer can use an essential oil or carbolic acid with it. Its non-poisonous, non-escharotic nature, and the fact that it roughens the hands but slightly, commend it to dental practitioners.—*Dr. Meriam, in the International Journal.*

VERMONT STATE DENTAL SOCIETY .

The 15th Annual Meeting of the Vermont State Dental Society, was held in Rutland, March 18-20, 1891.

The following were elected officers for the ensuing year:

President—W. S. Curtis, West Randolph.

First Vice-President—G. F. Cheney, St. Johnsbury.

Second Vice-President—A. J. Parker, Bellows Falls.

Secretary—Thos. Mound, Rutland.

Treasurer—W. H. Munsell, Wells River.

Executive Committee—E. O. Blanchard, West Randolph; W. H.

Wright, Brandon; W. H. Kingsley, Middlebury. State Prosecutor—G. W. Hoffman, White River Junction.

Next meeting to be held in Burlington, third Wednesday in March 1892. THOS. MOUND, Secretary.

BOOK NOTICES.

A Dictionary of Dental Science and such words and phrases of the collateral sciences as pertain to the art and practice of dentistry. By Chapin A. Harris, M.D., D.D.S., late Professor of the Principles of Dental Surgery in the Baltimore College; Member of the American Medical Association; Member of the Medico-Chirurgical Faculty,&c. *Fifth Edition.* Carefully revised and enlarged by Ferdinand I. S. Gayas. M.D., D.D.S., Author of "Dental Medicine;" Editor of Harris' "Principles and Practice of Dentistry;" Professor of the Principles of Dental Science, Dental Surgery, and Prosthetic Dentistry in the University of Maryland. Philadelphia: P. Blakiston, Son & Co. 1012 Walnut street. 1891.

The above work is presented to the Dental Profession in its *Fifth Edition.* We well remember the first edition and how we poured over its pages for the elucidation of what was obscure to us when we were studying dentistry, and when the means of information and dental literature was not as extensive as it is to-day. The work is in much better form and partakes more the character of "the manual." Many of the words, which swelled the proportions of the work without adding to its value have been suppressed, while such words added—without increasing the size of the book—as to make the revision most worthy. We are glad to possess a copy of the work and commend it to all students (old and young) of dentistry. This is the day for Dictionaries, Books of Reference and Encyclopedias, and he who is not abreast of the times cannot blame those who have the dissemination of knowledge at heart, but only themselves. ED.

Catching's Compendium of Practical Dentistry for 1890; B. H. Catching, D D.S., Editor and Publisher, Atlanta, Ga. Copyrighted 1890, Atlanta, Ga.. Constitution Publishing Company.

This long promised and anxiously looked-for volume is at last before us. To say that it has fulfilled expectations, is to say the least of it. It is *Vade Mecum* of all that is good and practical in dentistry, told in the shortest way by pithy articles. Indexed, as it is into "Operative Dentistry," "Prosthetic Dentistry," "Crown and

Bridge work," "Orthodentia," "Dental Medicine," "Oral Surgery," and "Miscellaneous" headings—the inquirer can readily find something relating to these subjects, without trouble, and to the point.

Ed.

A Dictionary of Practical Medicine. By various writers, edited by James Kingston Fowler, M. A., M. D., Fellow of the Royal College of Physicians; Senior Assistant Physician to the Middlesex Hospital, &c. &c. &c. Philadelphia, P. Blakiston, Son & Co., 1012 Walnut Street, 1890.

This is truly a valuable book, which should be in the hands of all men of families. By its arrangement in dictionary form, any ailment of the body can be readily traced, and the head of the household use such means as will meet the case until medical aid can be secured. By means of the "General Index," each disease is given with the page, where the full description is recorded; and turning to this, a full diagnosis, symptoms and treatment follow, together with an entire management of the case, the character of the food to be given, the temperature of the room to be maintained, and all the sanitary means to be adopted. We give the book our unqualified approval, and recommend it as a valuable work for household as well as general medical treatment.

Ed.

Heredity, Health and Personal Beauty. By John V. Shoemaker, A. M., M. D., Professor of Materia Medica, Pharmacology, Thesapentics and Clinical Medicine, and Clinical Professor of the Diseases of the Skin in the Medico-Chirurgical College of Philadelphia; Physician to the Medico-Chirurgical Hospital, Member of the Amenical Medical Association of the Pennsylvania and Minnesota State Medical Societies, &c., &c., &c. Philadelphia and London. F. A. Davis, Publisher. 1890.

The above is a very readable book. The style is taking, and the language clear, concise and elegant. The general laws of health; the regulated laws of life and growth; the sources of beauty; the training of the physique; the art of walking; the bath, as promotive to health and beauty; the care of the hands, feet, hair and nails, and very many other subjects are so nicely told, and so interestingly treated, that the reader is led from one theme to the other, with such fascination, that the whole book is read with the pleasure of an interesting romance.

Ed.

OBITUARY.

AMBLER TEES, A. M., D. D. S.

It is our painful duty to announce the death of Dr. Ambler Tees, of this city, on April 11th, after a short illness, in his fifty-fifth year.

Dr. Tees was too well and favorably known to the profession to need any extended eulogium. An earnest, honest man, a skillful practitioner, a genuine artist in the beautiful work that was his specialty, a sincere Christian, and a firm friend; our eyes are moist as we write and realize that he has passed away forever.

He graduated from the Central High School of Philadelphia in 1853, and went to New York to study dentistry with his brother-in-law, Dr. J. G. Ambler. He practiced in that city a few years, when he returned to Philadelphia and graduated from the Philadelphia Dental College, and remained in practice in this city until his death.

In continuous gum work, we believe, he held second place to none. He gave clinics on this work in all three of the colleges, and was at one time lecturer on it at the University of Pennsylvania.

He invented the Tees clamp, the sub alveolar forcep, and the Lilliput furnace. He was connected with the Odontological Society of Pennsylvania, the Odontographic Society, and the American Dental Convention. He was secretary of the Odontological Society from 1879 until 1889.

He was the first editor of the predecessor of this journal,—The Dental Quarterly,—and the management parted with him very reluctantly when his increasing practice decided him to resign. His death was due immediately to angina pectoris.

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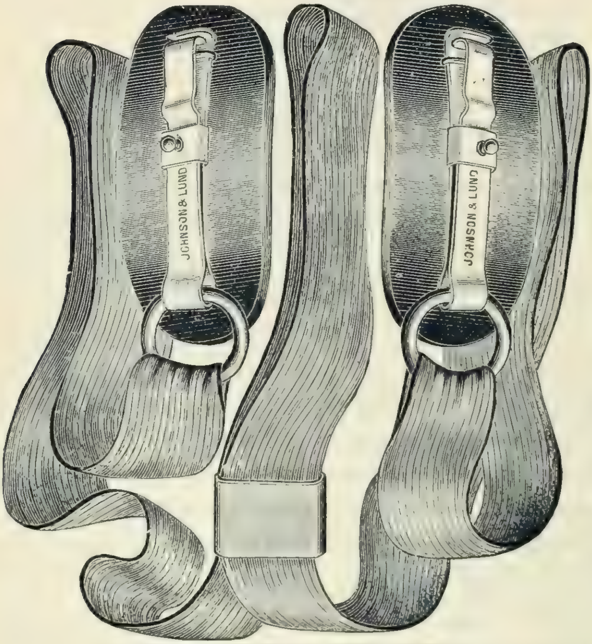

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FOURTH SERIES.

VOL. 5. PHILADELPHIA, JULY, 1891. No. 4.

EIGHTH PAPER ON

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

(Continued from Page 72, Vol. 5, No. 3.)

OPENING CAVITIES.

By opening cavities is meant the crushing away of weak unsupported enamel, in order with more facility to remove the decay existing in the underlying dentine. As a rule, it may be said "cut the enamel *freely* but cut tne dentine *sparingly*." In opening all cavities, the weak, thin enamel should be freely cut away, except perhaps in cases of the front teeth, where this tissue may be left, and supported with phosphate cement.

For opening cavities in the masticating surfaces of the molars and bicuspids, enamel chisels, such as are shown by Fig. 134, will be

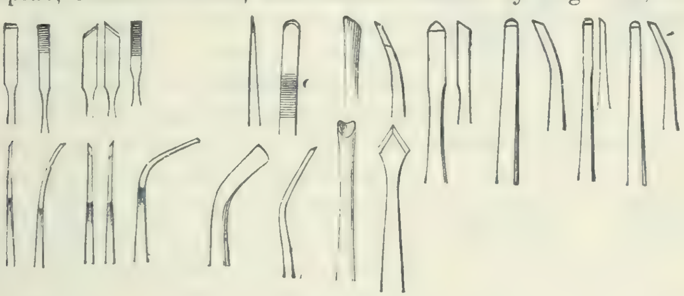

FIG. 134.

found available for such cavities, in both the upper and lower bicuspids and molars. The object of the chisel is to cut away the enamel so as to obtain readier access to the cavity. The shaping of the cavity should be as nearly round as possible. After the weak unsupported enamel is crushed away with the chisels, and the cavity opened, the decayed dentine is removed with excavators. The

rubber dam should then be adjusted over the teeth that are to be filled. For the removal of the decayed dentine from the cavity, excavators such as are shown by Fig. 135 will be found to apply

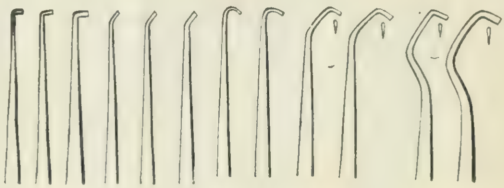

Fig. 135.

nicely. It is always best in the use of excavators or chisels (or burs in the dental engine), to begin with *small instruments first*, and to increase the size of the tool as progress is made. Do not attempt to peel off a large piece of decay at one cut. It gives less pain to do this by cutting small pieces, with small instruments, than to attempt to remove all with one desperate cut. If we watch a carpenter at work, we will find that he uses the same means. He takes off *a little* at a time, rather than a big chip with one blow of his mallet on his chisel. In the removal of dentine, then, it is best to remove a little at a time. When the decay is removed, the cavity is more expeditiously shaped by the use of burs in the dental engine. The enamel at the *mouth* or *border* or *margin* of the cavity should be cut *smooth* by the use of fine cut burs in the dental engine. The walls of the cavity should be parallel, or with *a slight* enlargement of the cavity *within*, as shown in Fig. 136.

Fig. 136.

If there are two cavities in close proximity to each other, with only a thin septum of tissue between them, like Fig. 137 A, it is better to cut away the septum and incorporate the decays into one cavity, as at B. Should there be a central cavity, however, with radiating fissures of decay, it will not be proper to cut all the fissures away so as to form it into one cavity, but the central cavity may remain as it is prepared, and the fissures radiating from it cleaned out and united with it as shown by Fig. 138.

Fig. 137.

Fig. 138.

For opening cavities in the upper incisors and cuspids, on their proximate surfaces, the tooth may be dressed away from their palatal surfaces with trimmers, like Fig. 139, so that the

cavities may be easily approached without marring the outer surfaces, as shown by Fig. 140, or they may be separated and the proximate surfaces of the decayed teeth cut away with a small corundum point, used on the right angle attachment of the dental engine, as shown by Fig. 141, the head of the patient being thrown well back while doing this. The approach to the cavities being thus made, the rubber dam is applied and the cavities shaped. The decay is removed with excavators, such as one shown at Fig. 135, after which the borders of the cavity are made smooth with fine cut burs in the dental engine, and the cavity properly shaped for the retention of the filling material. There are some operators who prefer not to do the cutting as shown at Fig. 140, but to open these cavities directly from the front or labial surface, as shown by Fig. 142. This is only admissible when the decay is located near the labial surfaces, as shown in Fig. 142.

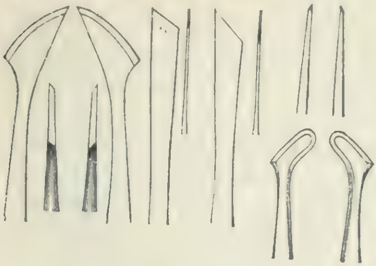

FIG. 139.

FIG. 140.

FIG. 141.

When the proximate surfaces of the molars and bicuspids are decayed, the cavities may be opened by first separating the teeth and then applying the rubber dam, after which they may be approached from their labial surfaces, provided the decay has not attacked the tooth inwardly towards its palatal surface. In such cases it *may* be approached from the palatal surface by using the dental engine on the right or left side of the operating chair, accordingly as the decay may be on the right or left side of the mouth. If the decay is *comparatively* extensive, leaving the enamel unsupported, it will be better to open the cavity from its masticating surface, as shown by Fig 143. When the decay is very extensive on these surfaces, all the weak parts of the tooth may be cut away with disks and small corundum points in the dental engine, after which the rubber dam should be applied, and the cavity or cavities prepared as shown in Fig. 144.

FIG. 142.

For opening cavities on the buccal surfaces of upper and lower

molars, and the palatal surfaces of the upper incisors or cuspids, the approach is readily made, first with small corundum points in the dental engine, and afterwards (when the rubber dam is applied) with burs and drills in the dental engine.

FIG. 143.

For cavities on the proximate surfaces of the lower incisors, the approach and opening is made from the labial surfaces. The teeth should be separated, then the rubber applied, after which the opening made and the cavity shaped with small burs in the dental engine, or with small excavators, such as are shown in Fig. 135.

FIG. 144.

FORMING CAVITIES.

In shaping a cavity for the retention of the filling material, a round form, or a shape nearly approaching this form, should be aimed at. This of course can only be accomplished where the cavity has completely circumscribed walls, as in the crown cavities of the molars and bicuspids, the palatal cavities in the incisors, the buccal cavities of the molars, and in the proximate cavities of any of the teeth when the decay has not progressed to considerable proportions.

In the formation of the walls of proximate cavities where the decay has become so extensive as to destroy the continuity of the tooth tissue, the wall at the cervix should be at *right angles* to the long axis of the tooth. This wall may be grooved, or it may have retaining pits. The wall towards the palatal (or lingual) aspect, and the wall towards the labial aspect should also be grooved. In molars and bicuspids, where this grooving is impracticable, a dovetail is cut, as shown in Figs. 143 or 144.

In making retaining pits to start the filling, the pit should be drilled *into the dentine*, but quite near the enamel and in a direction *from the pulp*, pointing towards the root of the tooth, as shown in Fig. 145, and towards the cutting edges of the incisors. In the proximate surfaces of the molars and bicuspids the cavities should be grooved for the better retention of the filling material. A hook excavator, such as is shown at Fig. 135, is very serviceable to make this groove. In cavities of moderate size *one* retaining pit will be sufficient, but where the decay is extensive, two or more may be needed, as also a very decided groove or undercut towards the cutting edge, as shown at Fig. 145 A. In cavities in the molars and bicuspids, where the decay is extensive, without involving the pulp, two retain-

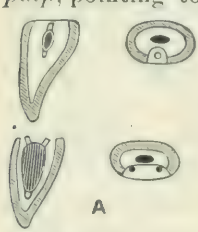

FIG. 145.

ing pits towards the cervix and a groove towards the palatal and labial surfaces will be sufficient to retain the filling, as shown in Fig. 145 B. In the longitudinal figure the dotted lines indicate the groove. In the transverse figure the groove is also shown. In all the cuts are shown the position of the retaining pits, the groves and undercuts.

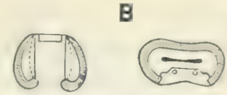

Fig. 145 B.

FILLING THE CAVITY.—INTRODUCING THE GOLD.

In filling the cavity, when retaining pits are used, these must be filled first. They should be filled with the smallest cylinders of gold, or with very small pieces of crystal or sponge gold. It should be carried to the cavity with very delicate pointed foil tweezers, like Fig. 146, preferably straight pointed, but very delicate at the points. The gold being introduced into the pit, it is thoroughly condensed with pluggers, like Fig. 147, using the large or medium size first and then the smallest one, so as to be sure that the gold is made solid. It is useless to endeavor to introduce a large pellet or cylinder into these retaining pits, for in the effort to do this, the gold will be pierced by the plugger, and powdered or chopped to pieces, and the pits will not be filled. Unless small pieces are used, the pits may possibly be bridged over or choked at its entrance, so that it affords no retention to the filling, and therefore does not serve the purpose for which it was intended.

The pit or pits being filled, gold is added piece by piece, in small quantities, each piece being thoroughly condensed as it is added, being careful that the cervical wall (which is the vulnerable point) is thoroughly covered, and the gold brought in the most intimate contact with it. As the gold is introduced it is kept level, so as to avoid all little pits and elevations, as the filling progresses. As this proceeds, the grooves in the bicuspid or molar cavities are filled; but in the incisors the floor of the cavity may be covered, so that it may be brought down towards the cutting edge, when the under cut at this point may be filled, and thereby give more stability to the filling, after which more and more gold is added, until the cavity is entirely filled. The pluggers, Fig. 148, will be found to apply well in filling and condensing the

Fig. 146.

gold in the undercut of the incisor cavities. Where grooves or undercuts are made, instead of retaining pits, a mat, cylinder or pellet is placed in these places. It is condensed thoroughly in its position, and held in place by one of the instruments like Fig. 149, until sufficient gold is introduced into the cavity to assure its stability. In very extensive fillings where matrices are used to assist the operator, such as is shown by Fig. 144, retaining pits are not as good as grooves, and mats of non cohesive or semi cohesive gold may be used with good effect until the cavity is nearly filled, when it may be completed by the addition of cohesive gold. When the gold is nearly all introduced it is well to heat a flattened cylinder sufficiently large to cover the entire area of the filling, and to *burnish* this on to the gold that had been introduced with serrated points; in this way all the little pits left by the serrations will be filled, and the burnisher will leave the last piece applied quite smooth. The gold is now cut down even with the borders of the cavity with fine files, emery strips, corundum or sand paper disks, in the engine, or with small corundum points. When thus reduced, so that there will be *no overlapping edges of the filling*, the gold is made perfectly smooth, and is nicely polished with fine crocus cloth disks, or crocus cloth strips. A very nice polish may be obtained, after the rubber dam is removed, by the use of Dr. Wood's small rubber cups, mounted on a suitable mandrel, as shown by Fig. 150.

FIG. 147.

TOOTHACHE.

The dentist, like all persons engaged in callings of humanity, should be sympathetic and always alive to the relief of suffering, and always able to suit the means to the ends for the relief of pain. Where toothache arises from some irritating particle of food entering a cavity of decay, relief may almost always, and almost instantly, be given by simply cleansing out the cavity, syringing it out with tepid water, drying it, and applying oil of cloves, creosote or carbolic acid on a small pellet of cotton. When toothache arises from this cause, it should be the advice of the dentist to the patient to have the tooth filled *at once*. For should attacks of this kind recur, it will result in the inflammation of the pulp, which, if it be not attended to at once, will end in alveolar abscess. This kind of toothache is frequently termed by patients "jumping toothache." It is not persistent, but

FIG. 148.


FIG. 149.

comes on in paroxysms, the attacks being at intervals of varying lengths of time, due, doubtless, to the greater or lesser ravages of decay. It is a safe rule, that should these attacks recur four or five times, it will be better—in the large majority of cases—to destroy the nerve, than to make any attempt at nerve capping. If the pulp has not become so much irritated as to inflame or become congested with blood, from the effect of these repeated attacks, nerve capping may result beneficially; but in very many instances the shortest road to the end, and means tending most to the comfort of the patients, will be the devitalization of the pulp.

When toothache comes from inflammation of the pulp the pain is more persistent than periodical. At this stage patients will tell you that cold applications will give pain. After a time cold applications will relieve and hot applications will give pain. When toothache has progressed thus far, we have generally found that the pulp, (if not actually suppurating,) is in a fair way thereto.

When the tooth gives pain in drinking cold or iced water, or eating iced cream, and the patient comes to obtain relief, the cavity should be gently cleansed and dried, and an application of acetate of morphia, mixed to a paste, either with oil of cloves or creosote, applied, and sealed with cotton, temporary stopping, or adhesive wax. If relief can be given by this treatment lasting for a day or two, with no recurrence of pain, the cavity may be filled with phosphate of zinc filling. And if such a filling result in the entire subsidence of pain, the tooth may be left with such a filling for six months or more, after which a portion of this temporary filling may be cut away and the cavity filled with gold or amalgam.

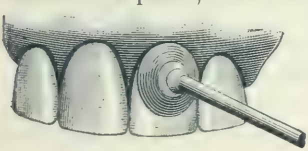
FIG. 150.

When toothache results from suppuration of the pulp, the patient will describe it as persistent or "no let up." They cannot sleep at night. The pain is worse when lying down than when sitting up. At first there is a desire to bite hard on the offending tooth, but after a time the mere bringing of the teeth together gives intolerable pain, and the patient is forced to keep the teeth separated and to eat only liquid food. To give relief in such cases you will have first to give pain. The nerve chamber will have to be opened. If the suppuration has only extended to the pulp a profuse flow of pus will result, which will be followed by almost immediate relief. In such cases the roots and crown should be treated and filled, for if left until the sup-

puration of the pulp has extended to and involved the peridental membrane, the case will be invested with greater complications, and less easy to cure.

If toothache is only eased for a short time by the application of morphia mixed to a paste with oil of cloves or creosote, and the pain recurs after several efforts of this kind to give relief, it will be useless to attempt nerve capping. The pain should be eased and, before it recurs again, the patient directed to return, that an application of arsenic, for the devitalization of the nerve, be made.

Patients will present describing pain to exist in a certain tooth, which, on the most careful examination, will reveal no cavity, no cause for suffering. The cause then must be sought elsewhere. This pain is called " reflex pain." when we endeavor to persuade patients that the pain they suffer does not exist in the tooth they point out, but in some other locality or some other tooth, they will at times think that you do not know of what you are speaking, and some will insist on the extraction of a perfectly sound tooth. We have endeavored to convince them of *their error* by presenting the case with an example of almost daily experience, as follows : " You see the moon shine, but you know that the light does not come from the moon, but from the sun, and is only reflected on the earth by the moon, just as if the moon was a large mirror. Thus you see that the cause of the light exists with the sun and not in the moon. So also, though the tooth you point out *appears* to be the cause of pain, it is not actually so, since we can discover no decay about it, and therefore we must look for the cause elsewhere, because a perfectly sound tooth cannot (but rarely) give pain." Being thus reassured, we should make a rigid examination *of all the teeth*. It matters not how *near* or how *far* the cause of the pain may be from the *apparent pain*; whether it be on the right side or left, in the same or in the opposite jaw, the cause must be found. In our search for the cause, *eve y surface of every tooth* must be made. The probe should seek beneath the gum as well as on all exposed surfaces. It is true that we cannot always diagnose a case from the description of the pain from patients, and thus we sometimes grope in the dark. Sometimes a tooth with a very small and superficial filling may be described as the cause of the pain, and to our extreme surprise it will at times be found the actual cause of pain ; it will be affected with incipient abscess ; it will look life-like and transparent, with none of the opacity common to teeth with dead pulps. The guide in such cases is to tap the tooth, and ask if a different sensation is felt when other teeth are struck to what is

experienced when the affected tooth is struck. The cause being found, the remedies for relief are then applied.

Again, when a thorough search reveals no cause for suffering in the tooth pointed out by the patient, we are justified often, by the general characteristics of the patient, to resort to the devitalization of the pulp (before resorting to extraction), in order to give relief. In such cases the pain may be due to "*pulp nodules*," which can only be relieved in this way. In persons with soft chalky, or highly vascular teeth, we seldom find pulp nodules; but in persons whose bodies are "well made up," strong and hearty, hard muscles, hard bones, yellow flinty compact teeth, and the whole system "well organized," *pulp nodules* may be diagnosed as the cause of pain, and the remedy proceeded with as above advised.

In other cases pain will be located in a tooth in which we only observe a considerable rescession of the gum, as, for example, on the palatal root of an upper molar. In such cases we may find the tooth perfect in every respect; but this excessive rescession of the gum may have so nearly exposed the nerve running from the foramen at the point of this root as to cause great pain. If such a tooth be firm in its socket, and has a good antagonizer, its preservation should be advised; if loose, and without an antagonizer, its extraction. To give relief in such cases, the nerve at the apex of the root may be amputated with a small fissure bur in the dental engine, or the whole nerve may be destroyed by the application of devitalizing paste.

KILLING THE NERVE.

The application of arsenic for killing the nerve should be made in the most careful manner. When the cavity exists on the crown surface of an upper or lower bicuspid or molar, the application can be made without the use of the rubber dam; *but in all approximal situations the rubber dam should be applied.* It is best always to apply the arsenic *directly to the pulp*, to prick it in so as to be sure that the devitalizing agent is in contact with the organ, but as this is sometimes unbearable, more than one application has to be made. The first application will usually deaden a certain territory of depth of dentine, whereby the nerve chamber may be freely opened, so that the second application may be placed *in direct contact.*

To apply the arsenic, as much as possible of the disorganized tissue should be cleared from the cavity, and this (the cavity) made dry. A small probe should be dipped into the bottle of nerve paste, and a quantity, no larger than the head of a pin, taken up on the end of the

probe. A little disk of "tea chest lead" can be cut from a sheet of this with the rubber dam punch. Such a little disk will generally be concave, or if not so, it can be easily made so by placing it on a piece of soft wood and pressing it with a small ball burnisher, or with the ball end of an excavator handle. The nerve paste should be carried on the probe, and placed in contact with the nerve, or if the nerve be not exposed, it should be placed at that point where it is known to be nearly exposed. The concave side of the little lead disk should be be placed over the application of arsenic. The disk is then held in place with a small pellet of cotton, and the cavity sealed with adhesive wax or temporary gutta percha stopping, which is a mixture of wax and gutta percha: It is not a good plan to seal an application of arsenic with cotton steeped in sandarac varnish, for frequently the varnish from the cotton oozes out and flows all over the cavity, beneath as well as above, and all around the devitalizer, which thereby encysts the drug and prevents its action. Some operators prefer to fill the little concave disk with the devitalizer, applying this in position and sealing it in the manner described, but we prefer to use it on the probe, so as to be sure of making the application directly to the nerve, when possible.

At one time the application of arsenic to devitalize the pulp was attended with very great pain, and we had often seen patients in such a delirium of torture from such an application, that we hated (when we found it necessary) to use it, because of the pain it caused; but recent investigation and experiments have in a very great measure overcome these sequences, and it is now possible to destroy the nerve with actually *no pain at all*, in the very large majority of cases.

Prof. James Truman recommends the following as a painless preparation for devitalizing the pulp: "Take the amount of arsenic it is proposed to employ, and add an equal quantity of iodoform, and on a glass slide, by means of a 5 per cent. solution of carbolic acid, make a paste. The whole is carried to the pulp on a piece of cotton the size of a pin-head, it which it is incorporated, and covered with a cap of platinum or of red gutta percha, and over this a temporary filling of wax, or cotton saturated with sandarac."

It is advised to let the arsenic remain in contact with the nerve for twenty-four hours, and then to remove it, and let the dead nerve slough away, so as to remove it from the roots with more facility and with less pain; for strange as it may appear, although the nerve may have been killed, its removal is attended with pain. This pain is accounted for in this way, that although a large part of the nerve

may have been killed by the action of the arsenic, still that part of it which passes through the formina at the end of the root is still embued with great sensibility, if not vitality, and in passing the barbed nerve broach into the roots for the purpose of removing the dead organ, the dead organ is pushed against the sensitive or live part, and in this way great pain is often experienced. We have not found it either dangerous or disadvantageous to let the arsenic remain in a tooth for a week or more, nevertheless, we do not advise this, nor do we always pursue such a course. There are some localities where arsenical applications have to be made where it is impossible to apply the rubber dam, as for instance on the buccal face of a lower second or third molaar, where large part of this surface is destroyed by decay, or in an upper or lower root of a tooth, the crown being so broken away and presenting so conical a shape that nothing can be used to retain the nerve paste in place. In the former case we apply the arsenic on a piece of cotton, covering this with a larger pellet of cotton, and to the larger pellet applying sandarac varnish, by means of a pellet held in the dressing tweezers, Fig. 146. This is then *tied in*, with ligature silk passed around the tooth. In the case of a broken down tooth, where there is nothing to hold the arsenic "in situ," it has been advised to stretch a small piece of rubber tubing over the remains of the tooth, as shown in Fig. 151, and into the receptable thus formed make the application of arsenic.

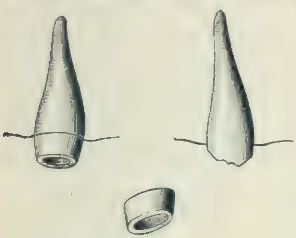

FIG. 151.

CORRESPONDENCE—DARK JOINTS.

EDITORS DENTAL OFFICE AND LABORATORY.—Sirs: I notice a communication in your last issue from Dr. Hill in regard to dark joints. He recommends the removal of every other block and the cleaning of the wax from the joint, &c.

Let me say that he who allows wax to get into the joints of artificial teeth will as *the exception have clean joints not the rule.* The wax, if left in any amount, even no more than will remain after being washed in boiling water, will dissolve the joint, the heat of vulcanizing being sufficient to de-hydrate the wax and leave a carbon stain.

If the Dr. will prevent any wax whatever from getting into the joints of his case by simply wetting the joint with a portion of a drop of water and then, when the case is waxed up, covering the exposed

portion of the joint with phosphate cement, even over into the grinding surface of the teeth and also into the lingual surface of the wax plate, and then, when flashed and separated, will do the same to the inside of the joint, he will have very few dark joints. Of course he must be careful not to use too much cement at those places where it would show on the finished plate. Then too, let me add that the flasks which are ordinarily found in the market are too light and spring under pressure. I had some made a while ago, and the ones I am using daily weigh $3\frac{1}{2}$ pounds. Those that will go into the old Whitney vulcanizer weigh $2\frac{3}{4}$ pounds, and the weight is mostly in the rim.

I never allow a case to be packed that has had wax in the joints without first grinding the joint clean. Yours truly,

Rochester, N. Y., May 6, 1891. JAMES H. BEEBE.

THERMOMETERS.

A HINT.

There are some thermometers attached to vulcanizers which give considerable annoyance, in the process of vulcanizing, by the column of mercury becoming *divided*. The divided portion will remain at a fixed point in the top of the tube, while the remainder descends into the bulb when the heat is removed. This gives annoyance, and uncertainty as to whether the heat has been kept up to the proper degree. It has been recommended to remove the thermometer by unscrewing it from the top of the vulcanizer, and by taking it in the right hand striking it sharply into the hollow of the left hand, being careful not to strike the bulb, (hit only the case) to avoid breaking the thin glass (which is only an extension of the tube) of which it is made. This will *sometimes* cause the separated columns of mercury to unite and no further trouble of the kind will occur. This, however, will not always be accomplished, and we have found when a trouble of this kind occurs with a thermometer, to unscrew it, as advised, but instead of seeking to make the mercury in the tube unite with that in the bulb, to turn it *upside down*, and make what is in the bulb unite with what is in the tube. Worked in this way we have found the mercury to coalesce perfectly, and not cause annoyance of separating as it sometimes does.

CROWN TOOTH LITIGATION.

THE U. S. SUPREME COURT DECLARES THE PATENT INVALID—A FINAL VICTORY FOR DR. GAYLORD.

The supreme court of the United States probably puts an end to all litigation over the alleged crown tooth patent by declaring that

patent invalid in the suit of the International Crown Tooth company of New York against Edward S. Gaylord, the dentist of this city. The decision which was handed down yesterday is quite a feather in Dr. Gaylord's cap as well as his attorney, John K. Beach, who was pitted against the famous patent law firm of New York, Dickerson & Dickerson. The suit has been hanging fire in the courts for six years, waiting for the slow moving wheels of justice to revolve around to it, and its salient features are pretty thoroughly known among the dental profession. But the suit is also a matter of general public interest, originating as it did from the so-called Richmond crown tooth process, which C. M. Richmond, of New York, claimed to have invented between nine and ten years ago. Mr. Richmond created no little interest among the dental profession by the process, which consisted of mounting a porcelain tooth to a root by means of a gold band. It was Mr. Richmond's custom to teach dentists his process, and on one occasion, about eight years ago, he spent an entire day with Dr. Gaylord, giving him instruction in the new process, and for which instruction he was well paid by the doctor.

Later Mr. Richmond took out a patent for his invention and sold it to the International Crown Tooth company. This company immediately assumed its rights under the patent and demanded a royalty from all dentists who were using the crown tooth process and issuing licenses to those who desired to use it. Dr. Gaylord claimed that he had bought his right to use the process and refused to yield to the demands of the International Co. Accordingly, in January, 1885, a suit was brought against him to enjoin him from using the patent. A trial was held in the United States circuit court held in this city in April 1887, Judges Shipman and Wallace hearing the case. It was argued by E. N. Dickerson, Sr., and E. N. Dickerson, Jr., for the plaintiffs and John K. Beach for the defendant.

The judges declared the patent invalid—a signal victory for Dr. Gaylord.

The plaintiffs then appealed and the case went on the trial calendar of the United States supreme court, and remained there, as cases generally do, until the court was able to reach it. A year or two later, while the case was still on the docket waiting trial, Attorney Dickerson died.

The case finally reached an argument before the supreme justices three weeks ago. Attorney Dickerson, Jr., argued for the plaintiffs and Attorney Beach appeared for Dr. Gaylord, being assisted by At-

torney Offield of Chicago, who represented the Chicago Dental Protective association.

The justices re-affirmed the [illegible] ion of the circuit court, Judges Shipman and Wallace, in declaring the patent invalid, Justice Brown writing the opinion.

There have been many litigations over the crown tooth process, and Mr. Richmond himself got into so much trouble over it that he spent a year in Ludlow street jail in consequence. He was sued by the International Crown Tooth Co. soon after they bought his patent, and refused to obey a preliminary injunction issued by the court. For this refusal he was committed to jail for contempt. It is said that Mr. Richmond was not the inventor of the process, but a dentist named Beers, of California.

[We append the letter of Dr. E. S. Gaylord in explanation of the shortcomings of the reporter.—Ed.]

New Haven, Conn., April 30, 1891.

Theodore F. Chupein, D.D.S.—Dear Sir: I was prompted to send you paper simply to announce our final success in the "Tooth Crown" litigation, and regret the reporter should have so completely slopped over as to utterly ignore the senior counsel, Mr. S. G. Gordon, and the New York Committee of Dentist's, Dr. A. L. Northrop, Chairman.

He was instructed to make only a court record notice, but instead, wrote a mass of verbiage evidently to fill up his paper.

Yours truly,

E. S. Gaylord.

April 9th, 1891.

Editor Dental Office and Laboratory: At the annual meeting of the Chicago Dental Society, held Tuesday evening, April 7th, 1891, the following officers were elected for the ensuing year: President, D. M. Cattell; 1st Vice President, J. W. Wassall; 2nd Vice President, E. M. S. Fernandez; Recording Secretary, L. L. Davis; Corresponding Secretary, T. L. Gilmer; Treasurer, E. D. Swain; Librarian, A. W. Harlan; Executive Committee, J. A. Dunn, G. H. Cushing, E. Noyes; Board of Censors, B. S. Palmer, G. J. Dennis, R. M. C. Paine. Thos. L. Gilmer, Corresponding Secretary.

Joint Dental Meeting of New Jersey and Pennsylvania State Societies, Asbury Park, July 15th, 16th and 17th, 1891.

Dear Sir: The Dental Societies of the States of Pennsylvania and

New Jersey intend holding a joint meeting at Asbury Park, beginning on Wednesday, July 15th, 1891, and continuing for three days. It is designed to make this session of the two societies one of the most memorable ever held in the Middle States.

The papers and essays will be read by men eminent in the profession, and the clinics will be of the most varied character, embracing every phase of prosthetic and mechanical dentistry.

As we anticipate a large assembly, the committee in charge of exhibits desires to have one of the finest displays in everything that enters into the workings of operative and mechanical dentistry.

We invite you to make an exhibit of anything in your control pertaining to dentistry. In order to arrange the same systematically and devise room for the exhibits, we ask that you reply before May 10th, stating the amount of space you will require and the class of your exhibits, which will enable the committee to print the same in the programme.

The committee will be at some expense in arranging for the exhibits, and a small amount will be charged to defray this expense.

We feel this exhibit will be the means of introducing many new and important features pertaining to the profession, which will be beneficial to all, and trust that you may take advantage of this opportunity.

C. W. P. Holbrook, D.D.S., 34 Park St., Newark, N. J.
D. N. McQuillen, D.D.S., 1626 Chestnut St., Phila., Pa.
Committee on Exhibits.

ALUMNI ASSOCIATION OF THE PHILADELPHIA DENTAL COLLEGE.

At a meeting held April 9th, 1891, all the graduates of the Philadelphia Dental College during the years '86, '87, '88, '89, '90 and '91 were elected members. Those desiring to accept such membership will please send to J. R. C. Ward, D. D. S., Treasurer, 1905 Fairmount avenue, Philadelphia, their name, address and one dollar entrance fee.

Alonzo Boice, President. L. Ashley Faught, Secretary.

ALUMNI ASSOCIATION of the Philadelphia Dental College was held at Colonnade Hotel, Fifteenth and Chestnut Sts., Thursday, April 9th, at 8 p. m. Officers were elected as follows: President, Alonzo Boice, D.D.S., Phila.; First Vice-President, James McManus, D. D. S., Hartford, Conn.; Second Vice President, D. N. McQuillen, D. D. S., Phila.; Third Vice-President, J. D. Thomas, D. D. S., Phila.; Secre

tary, L. Ashley Faught, D D. S., Phila.; Treasurer, J. R. C. Ward, D.D.S., Phila.; Executive Committee, J. L. Eisenbery, D.D.S., Phila.; F. L. Bassett, D. D. S., Phila.; M. H. Cryer, D D. S., Phila.

Pennsylvania State Dental Examining Board.

The Pennsylvania State Dental Examining Board will hold the regular annual meeting on July 14th and 15th, in Justi's Hall, corner of 13th and Arch streets, Philadelphia, Pa. Candidates for examintion are requested to be present on the (14th) first day of the meeting and call on the President or Secretary promptly.

W. E. Magill, President, Erie, Pa.

I. E. Green, Secretary, West Chester, Pa.

The American Dental Society of Europe will hold its Seventeenth Annual Meeting at Heidelberg on the Neckar, in the beautifully situated Schloss Hotel, on August 3d, 4th and 5th of this year. The officers for the year are: President, Dr. William R. Patton, Cologne; Vice-President, Dr. Isaac B. Davenport, Paris; Treasurer, Dr. Chas. H. Adams, Frankfort; Secretary, Dr. Lyman C. Bryan, Basel; Executive Committee, Drs. Patton, Adams and Wetzel; Membership Committee, Drs. Davenport, Jenkins and Prof. Miller. Members of the profession are cordially invited, and are requested to notify the Secretary at an early date of their intention to attend the meeting, contribute papers or demonstrate before the Society. Programmes will be issued by June first and may be had on application. The charming site of Heidelberg will allow the Society to intersperse its three days' proceedings with excursions to interesting points and visiting the University and the magnificent ruins of the castle.

American Dental Association.

The Thirty-first Annual Session of the American Dental Association will be held at Saratoga Springs, N. Y., commencing Tuesday, August 4, at 10 o'clock, A. M.

Geo. H. Cushing, Secretary.

Georgia State Dental Society.

At the meeting of Georgia State Dental Society, held at St Simon's Island, May 19 to 23rd, the following officers were elected: President, Walker G. Browne, Atlanta, Ga.; 1st Vice-President, S. M. Roache,

Savannah, Ga.; 2nd Vice President, W. W. Hill, Washington, Ga.; Corresponding Secretary, L. D. Carpenter, Atlanta, Ga.; Recording Secretary, S. H. McKee, Talbotton, Ga.; Treasurer, H. A. Lawrance, Athens, Ga.

Illinois State Dental Society.

At the twenty-seventh annual meeting of the Illinois State Dental Society, held at Bloomington, May 12-15, 1891, the following officers were elected for the ensuing year: President, W. H. Taggart, Freeport; Vice-President, Garrett Newkirk, Chicago; Secretary, Louis Ottofy, Chicago; Treasurer, W. A. Stevens, Chicago; Librarian, F. H. McIntosh, Bloomington. The next annual meeting will be held beginning on the second Thursday in May, 1892, at Springfield.

Louis Ottofy, Secretary.

EDITORIAL.

Wm. H. Atkinson, M. D., D. D. S.

The scourge "La Grippe," which has carried away so many, of high and low degree, has made a victim of one of the most eminent in our profession.

Dr. Atkinson, a man universally loved, respected and esteemed, died from the effects of this disease in the seventy-sixth year of his age.

We know no man so generally liked, so cordial in his greeting, so even in temper, so warm in his friendship as Dr. Atkinson.

Our first meeting with Dr. Atkinson was at Charleston, S. C., when the Southern Dental Association met in that city in the year 1874. At the conclusion of the session the dentists of the city had arranged an excursion, for the entertainment of their guests of the Southern Dental Association, up the Ashley river, and we recall the delight of Dr. Atkinson as he witnessed the local scenery from the deck of the steamer, or went into ecstacies over the long flowing moss, which hangs in luxuriant masses and festoons from all the trees near the river banks, or indeed, everywhere. The long, low, flat country, with its endless swamps, dark damp lagoons, and spontaneous vegetation, with the air redolent with the perfume of innumerable self-cultivated flowers, was a sight so new to him, so different to the high lands and mountainous scenery of his home, that he could not repress the delight he felt at witnessing scenes so entirely different from those he had been accustomed to view, and his expressions of delight

were as spontaneous and ingenuous as those of a child witnessing the changes of a kaleidoscope.

With his fluent tongue, his ready wit, his genial repartee, he entertained his entertainers, and Dr. Atkinson was the "lion of the party." The Franco-Prussian war had but a few years previously closed, and from the circumstances of our wavy long moustaches at that time, somewhat in the style of the unfortunate captive of that struggle, he seemed to delight in calling me "Napoleon!!!" which he did with a hearty laugh and genial good nature whenever he saw me, either then or at future meetings in after years.

Our remembrance, intercourse, correspondence and association with Dr. Atkinson have always been of the most pleasant kind, and there is no gentleman in the profession who won the heart of his associates or claimed their respect with more genuine warmth and affection.

Of his antecedents we know but little; but of his earnest work, his whole-hearted love for the profession of his choice, we, and all his confreres, will gladly accord him. May his soul rest in peace!

Pennsylvania Association of Dental Surgeons.

At a meeting of the above Society, held on the evening of the 14th May, the following preamble and resolutions were passed on the death of Dr. W. H. Atkinson, of New York:

Whereas, it has pleased Almighty God, in His great wisdom, to remove from amongst us, and to call, we trust, into His Divine presence, our esteemed friend and contemporary, Dr. W. H. Atkinson; and

Whereas, Dr. Atkinson was a man universally beloved and respected by the *whole* dental profession; and

Whereas, the high position in the profession of Dr. Atkinson, although not a member of this Society, renders it appropriate that we should take action on his death; be it therefore

Resolved, that in his death Dentistry has received a severe loss, both in the eminence of the man and as a teacher such as we all acknowledge he has been;

Resolved, that we deplore his death for his intrinsic worth, for his genial good nature and for his generous fraternity;

Resolved, that we find it difficult to put in words all the sentiments of affection, esteem and professional pride which we feel for our lost brother, and that a copy of these resolutions, although poorly repre-

senting our feelings, be sent to the dental journals, and spread upon our minutes.

W. H. TRUEMAN,
L. ASHLEY FAUGHT,
W. H. ROOP,
Committee.

MAY 8TH, 1891.

EDITOR DENTAL OFFICE AND LABORATORY: At the meeting of the Chicago Dental Society, Tuesday evening, May 5th, 1891, the following resolutions on the death of Dr. William H. Atkinson, of New York, were adopted:

Whereas, the Chicago Dental Society having learned of the death of Dr. Wm. H. Atkinson, of New York, one of the most eminent, learned and best known members of the Dental profession, therefore, Be it resolved—

That in the death of Dr. Atkinson the members of this Society feel a sense of personal bereavement in the loss of a much loved and conspicuously useful member of the profession, and while we bow in humble submission to the Divine will we desire to express our sorrow in his final exit to the unknown land beyond this world of ours. Be it further resolved that the Secretary transmit to the bereaved family of Dr. Atkinson a copy of these resolutions, and that a copy be furnished to the Dental Journals for publication.

J. H. CROUSE,
A. W. HARLAN,
W. W. ALLPORT,
Committee.

NEWARK, N. J., May 8th, 1891.

At a meeting of the "Central Dental Association of Northern New Jersey," held April 20th, 1891, the following resolutions were unanimously adopted, and a motion was carried that a copy be sent to the bereaved family, and sent to each of the Dental Journals, to be published.

Respectfully,
S. S. HAWLEY, Sec'y.

We, the members of The Central Dental Association of Northern New Jersey, having learned with sincere regret of the death of our friend and fellow member, W. H. Atkinson, M. D., D. D. S., of New York, who by reason of his great abilities, scholarship, zeal, industry, and self-sacrificing devotion to the interests of the dental profession,

and the never failing willingness to impart his knowledge to all who asked it, he was recognized by us as the most influential member of our profession, a man who devoted his life to its honor and advancement.

During the eleven years of the existence of this Society, he has scarcely missed a meeting, and his relations with us have been such that it is our pleasure and duty to record our high appreciation of him.

That by the death of Dr. Atkinson the dental profession has been deprived of one of its most able and useful members, one whose influence for good will last while dentistry exists.

We have lost one of our best friends, and as we fondly called him "Father Atkinson," so indeed do we feel we have lost our "Father in Dentistry."

We therefore extend to his family, and to our brother members of the dental profession, our sincere sympathy in their great bereavement, and that a copy of these resolutions be sent to the family of the deceased, and that they also be published in the dental journals.

(Signed) J. Allen Osmun,
C. S. Stockton,
Chas. A. Meeker,
S. C. G. Watkins,
C. W. Holbrook.
Committee.

THE PRACTICAL PLACE.

Neuralgia.

Friedburg (cited by Brubaker) has reported in detail (Virchow's Archiv-Band XVIII.) several typical cases of neuralgia caused by dental irritation. Here is a specimen:

A patient, aged thirty-seven, a working woman, began to be troubled with pains by swelling in the finger joints. She attributed them to washing in cold water. Sometimes the pains extended up the arms, even to the shoulders. After two or three years of this misery, oft-repeated attacks of neuralgia in the left side of the face supervened, with prickling, burning and darting pains, which shot from beneath the ear through the cheek and temple. At times the eye and forehead seemed to be the seat of the assault; *then* they were specially severe. She did not know whether the *teeth themselves* ached during the attacks or not, but was positive the beginnings of the seizures were *not in them.* After suffering for five years with

variable periods of freedom from the attacks, sometimes as long as two weeks, the extraction of the cuspid and third molar of the upper jaw, which were carious, gave instant relief, and the next day she reported the first night's rest for a long time. The cure was complete.

Safe Practice.

It is safe and good practice to touch walls and base of cavities with creosote before filling. If there is near approach to pulp, concave a piece of lead of suitable thickness, fill with beeswax and place upon base of cavity, convex up, then with serrated instrument press to position and fill. Beeswax is the most soothing, unchangeable, non-leakage material that can be placed on base of cavity for pulp protection; it is non-irritating, non-conducting in property and non-destructible when once in position; if it comes in contact with exposed pulp, will not produce unfavorable results as other material. If the pulp is diseased, I seldom treat for restoration to normal state (too many failures follow best efforts), but treat for removal; remove pulp and nerve and fill roots with beeswax and cotton fibres, pack or fill roots to level with base of pulp chamber, then locate a piece of sheet lead of thickness to suit, as a base for filling, and fill to completion. After such procedure there is seldom any complaint of discomfort.

Dr. W. N. Murphy's formula for impression material, from which a die may be cast direct: Plaster, 1 qt.; marble dust, 1 pt.; chalk, 1 pt. Mix and use as plaster.

Cement and Gold.—Dr. Oltramore, of Buenos Ayres, described his method of making fillings of cement and gold. He prepares beforehand a piece of gold of the size and approximate shape of the opening of the cavity, by condensing a few cohesive cylinders on a serrated steel plate. He then fills two thirds of the cavity with an oxyphosphate cement, places his prepared piece of gold on the cement while it is yet soft, and finishes the filling by putting on more cohesive gold, until the desired fullness is arrived at. Dr. Oltramore claims to have good results with these fillings and to save a great deal of labor. Time will test this method.—*Cor. Inter. Jour.*

Oxyphosphate with Gold or Amalgam.—Several years ago we called attention to the desirability, sometimes, of nearly filling a large

cavity with oxyphosphate, and then, before this cement has set, pressing in crystal gold. This gold can be added to as the cement hardens, and thus the filling finished with gold. This is much cheaper than an all-gold filling, and for frail walls better. A dentist called my attention to a similar practice by himself, that he considers quite an improvement in many instances on all-gold. The oxyphosphate so thoroughly adheres to the walls that it makes, he thinks, a more durable filling than all gold. Capping a large oxyphosphate filling with amalgam is preferable to all amalgam for the same reason.—*Ed. Items.*

A Local Anesthetic that is Safe and Reliable.—Much is said about local anesthetics. Patented nostrums and private formulæ are being hawked about the country, and sold from five to twenty five dollars to dentists. Permit me to suggest a preparation that I think will come as near "filling the bill" as any they have tried, both as to cost, safety and effectiveness. It is a five per cent. solution of carbolic acid in water. Four or five drops injected under the gum each side of the tooth to be extracted. In most cases this is effective. Swelling and inflammation around the teeth cause its action to be the more noticeable and satisfactory. Its effect is almost instantaneous. As one has to use twenty drops of this solution to get one drop of carbolic acid, I need not caution intelligent dentists against constitutional symptoms arising from a too free use of this agent, as it will not be necessary to use enough to produce such results.—*C. T. Meaker, Carbondale, Pa*

Care of the Hands.

There are not nearly so many secrets in hand treatment as people imagine. A little ammonia or borax in the water you wash your hands with, and that water just lukewarm, will keep the skin clean and soft. A little oatmeal mixed with the water will whiten the hands. Many people use glycerine on their hands when they go to bed at night, wearing gloves to keep the bedding clean; but glycerine does not agree with everyone. It makes some skins harsh and red. These people should rub their hands with dry oatmeal and wear gloves in bed. The best preparation for the hands at night is white of an egg with a grain of alumn dissolved in it. Quacks have a fancy name for it; but all can make it and spread it over their hands, and the job is done. They also make the Roman toilet paste. It is merely white of egg, barley flour and honey. They say it was

used by the Romans in olden times. Anyway, it is a first-rate thing; but it is a sticky sort of stuff to use, and does not do the work any better than oatmeal. The roughest and hardest hands can be made soft and white in a month's time by doctoring them a little at bedtime, and all the tools you need are a nail brush, a bottle of ammonia, a box of powdered borax, and a little fine white sand to rub the stains off, or a cut of lemon, which will do even better, for the acid of the lemons will clean anything.—*Ex.*

Different Diagnosis of Dental Pain.

In the *Journal* of the British Dental Association, Mr. H. Baldwin, M. R. C. S., gives the following useful table. For simplicity, the two kinds of pain may be called "nerve pain" and "pericemental pain."

NERVE PAIN.	PERICEMENTAL PAIN.
Arises suddenly.	Arises gradually.
Terminates suddenly.	Terminates gradually.
Is not continuous.	Is continuous.
Is chiefly non-localized.	Is distinctly localized.
*** Much neuralgia.	*** No neuralgia.
Tooth always sensitive to thermal changes.	Tooth not sensitive to thermal changes.
Percussion or pressure does not necessarily cause pain.	Percussion or pressure causes much pain.
Tooth not raised, not loosened.	Tooth raised and loosened.
Tissues around not inflamed, not tender on pressure over root.	Tissues around inflamed, tender on pressure over root; in chronic cases tissues thickened.

In using this table it must always be borne in mind that the two conditions of pulp inflammation and pericemental inflammation may co-exist either in the same tooth or in different teeth; and then the relative importance of the two inflammations will be determined by the relative severity of the two sets of symptoms, and sometimes by the history.

Benzoin Gum.

A thick tincture of benzoin on cotton is an excellent substitute for sandarac as a temporary stopping. It is also more agreeable to some patients than chlora-percha. It deserves consideration also as a material for filling roots.—*The Odontographic Journal.*

Dr. William A. Trueman sends us the following two items:

Parting Solution for Plaster Impressions.—Dr. Conyers Topley, of Germantown, Pa., recommends for this purpose equal parts of castor oil and coal oil, colored with aniline red. (Diamond dye, to

be obtained at most drug stores, while not quite as soluble, will answer the purpose. A minute quantity will suffice.) A thin coating insures a perfect parting. It soaks into the plaster of the impression, and does not fill up the fine lines as does varnish, etc., and yields a sharp cast.—*Items of Interest.*

COMBINATION OF CEMENT WITH AMALGAM.—Mix the Amalgam in the usual manner, avoiding an excess of mercury, whereas the cement is mixed perhaps slightly thinner than usual; the two are then thoroughly incorporated by means of a stiff spatula. The amount of amalgam used is, in bulk, about one-third to one-half that of the cement. The material may also be prepared by simply dropping the amalgam already mixed into the liquid of the phosphate cement, and then incorporating enough powder to make a stiff paste. The filling is inserted in the same manner as a simple cement filling.—*Cosmos.*

PLATINIZED SILVER.

Silver 4 and platina 1 part, makes a very good alloy for dental plates, it works easily in swaging and can be soldered with 18 karat gold solder.

This alloy is used quite extensively in England, we are told. Dr. Haskell recommends its use by dental students, and certainly it is much preferable to brass or copper for them; its cost is only one-fourth that of 20 karat gold plate; rubber can be used upon it for attachment, the same as on gold plate.

The alloy does not tarnish in the mouth, which fact is readily recognized when we know that the sulphuretted hydrogen set free in the process of vulcanizing does not effect the plate sufficiently to preclude its use in this way. It is as rigid as 18 karat gold plate, and is especially adapted for partial plates. We hope to see it adopted more extensively in the colleges and in practice; certainly it is worth an impartial trial.

APHRODISIAC EFFECTS FROM COCAINE have, according to the *North Western Lancet*, been reported by several observers, and the possibility of producing strong sexual excitement by the use of a small quantity of the drug should be borne in mind. With male patients the effect is of little consequence, but where the physician is alone with a female patient the consequences may be embarrassing if nothing worse. A Philadelphia physician reports giving a hypodermic in-

jection of few drops of a 10 per cent. to remove a small tumor. The erotic excitement that followed led the patient to behave in a most unseemly way, although her usual behavior was modest and becoming. A St. Paul dentist reports a similar experience, his patient making an indelicate exposure of the person while under the influence of a small injection of cocaine, Dentists should indeed be particularly on their guard, since they use cocaine so often in filling and extracting teeth, and are so frequently alone with their patients.—*Dental Record.*

Impression of Roots for Crowning.

Dr. Palmer places a wooden peg in the root and packs gutta-percha around it, forcing the gum out of the way, and takes the impression with the pin in place, which comes away with the impression.—*The Dental Cosmos.*

Make Your Own Heating Gas.

It may be an "item of interest" to some one, located as I am, where there is no city gas, to know how I constructed a good heating apparatus, producing a steady smokeless and hot flame, suitable for most laboratory operations. It can be constructed at a cost of not exceeding two dollars for materials and the production of gas at a mere trifle of expense.

I first made a small bellows, which forces air through a rubber tube to the bottom of a two-quart kerosene can, to the spout of which can is a rubber tube leading to a small gasometer, made of tin, varnished inside and out with asphaltum varnish. From this is a tube to a wash bottle, and from this is a tube to a bunsen burner.

I put about a quart of gasoline in the kerosene can or generator, work the bellows which forces air through the gasoline into the gasometer, where it awaits your pleasure in the form of a gas which is nearly equal to that servant which our city brother is so fortunate as to possess. A. W. Davisson, Holly, N. Y.

When to Extract the Six-Year Molars.—In the discussion on Dr. Cooke's paper on "Irregularities" as read before the Harvard Odontological Society and reported in the *Archives of Dentistry*, some interesting remarks were made. Dr. Clapp, in opening the discussion, said: "We must consider that when the teeth are in place, the hour for the exercise of great skill and judgment is not passed,

but has really come, and we must devote fully as much study, as much care, and even more, to retain the teeth in position as we have done in getting them into place. Dr. Cooke, on being asked what was the most favorable time for the extraction of the six year-molars, is reported to have said: "When the second molars are coming through the gum." We are glad to find that this bald and misleading statement was not allowed to pass unchallenged, Dr. Clapp immediately setting Dr. Cooke right by giving it as his experience that "if extraction is to be made to gain room, the best time is when the twelve-year molars are fully occluded, but if the teeth were to be taken out simply because they were badly decayed, and there was no need to gain room, I should prefer to take them out as soon as possible, so that the twelve-year molars might come directly in the place of the six-year molars." We should have thought this elementary principle of treatment was known to every tyro in dentistry, and ought not have needed reiteration.—*Dental Record (London).*

A New Material for Polishing Strips.

Almost every conceivable material has been suggested for the manufacture of strips for polishing fillings on the approximal surfaces of the teeth. I have found a very suitable material for this purpose in the tracing-cloth used by architects. The cloth is extremely tough, very thin (thinner than anything I know to be used for polishing fillings), pliable, and retains these qualities when moist. The tracing-cloth can be procured of any dealer in art materials or architects' supplies, and of some of the more extensive stationery dealers. It comes in widths of 36 inches and more, and is sold by the yard. The cost for the 36-inch width is 50 cents (2*s.* 1*d*) per yard. Try it.—*Louis Ottofy, D. D. S., in the Dental Review.*

Independent dental journals, or those published by dental dealers, can never be a question for discussion, as an independent dental journal never existed, and never will exist, owing to the condition of the money market. An endowment of $50,000 will not issue, permanently, 1,500 copies of a 48-page monthly without the support and assistance of *advertiser*, *subscriber*, *dead-head list*, and the profession generally. As we depend on these, we cannot say anything about an advertiser for fear the advertisement will be withdrawn. If we offend a subscriber he may discontinue. If we do not send free copies, we may lose a contributor, and if we say anything about advertiser, subscriber, free list or outsider, we may be

harassed with a threatened libel suit. So you see, my friends, that the so-called independence in journal work is only an attempt to deceive ourselves.—*Dr. Wm. Conrad, at Banquet of Missouri Association.—The Archives of Dentistry.*

Soldering Aluminum.

A late issue of *Nueste Erfindungen und Erfahrungen* says: The soldering of aluminum is a matter of so great importance that it cannot fail to be of interest to many to know that the Aluminum Company, of Neuhausen, Switzerland, is now offering to the trade a specially prepared aluminum, in sheets, which can readily be soldered with an ordinary soldering iron and tin solder. The line of juncture is prepared by applying a mixture of resin, tallow and neutral chloride of zinc. Scraping or otherwise cleaning the place to be soldered is to be avoided, although alcohol or turpentine may be used when cleaning is absolutely necessary.

Sheet aluminum may readily be soldered if previously given a light plating with copper. If aluminum so prepared is suddenly heated, there is considerable of the copper stripping off and rendering the joint unreliable. Nevertheless in many cases the process is very satisfactory, and particularly so when the copper-plated edges are allowed to lap over each other.

Aluminum bronze containing as much as five per cent. of aluminum may be readily soft-soldered with ordinary tin solder. Increasing percentages of aluminum render the soldering more and more difficult, until with 10 per cent. of aluminum it becomes impossible. The method above referred to, of slightly plating with copper, will be found a help in such cases. When no tank is convenient for dipping the edges into the plating solution, very fair results may be obtained by using a number of pieces of blotting paper well soaked with a solution of cupric sulphate. The paper is placed in contact with the article to be plated and with a piece of copper. The battery is then attached by wires with the positive pole to the copper and the negative pole to the casting or other object to be plated. A very short time is sufficient to give a plating heavy enough for soldering purposes. If for any reason a battery is not attainable for plating, the bronze may be prepared with a mixture of resin, tallow, neutral chloride of zinc and corrosive sublimate.

Hard-soldering offers no difficulties. A good solder for this purpose is made by smelting together 52 parts copper, 46 parts zinc and two parts tin. Borax is used as the flux, and the process is the usual

one. Tests of joints made with this solder were made at Neuhausen, and showed that aluminum bronze plates butted together gave a resistance to pulling strain of 26 to 28 kg. per square millimeter; lapped joints (5 mm. lap) required 39 kg. per square millimeter to part them.

Tubes made from sheets with this solder can be drawn down on a mandrel.

Aluminum bronze castings can be united by the process known to foundrymen as sweating or burning. The parts to be joined are placed in a sand mould and an excess of hot metal flowed over the joint. When carefully done the joint cannot be seen, and shows as great strength as the body of the casting. Thin cylinders may be made in this way by bending sheets and sweating their edges together.

Electro-Plating With Gold and Silver.—W. H. R., Cherokee, Cal.—For small gilding or silvering operations a 12-inch Daniel or Wollaston cell, or a half gallon cell constructed as follows gives good results. Within the cell jar place a cylinder of thin sheet copper with a binding screw attached. Within this cylinder place a porous cell, furnished with a plate or bar of amalgamated zinc, to which a binding screw is attached. Fill the porous cell with diluted sulphuric acid, and fill the space surrounding the cell with a nearly saturated solution of cupric sulphate slightly acidified with sulphuric acid.

The bath may consist of a quart of any of the various gilding solutions, the formulas for a few of which are given below.

For gilding small articles, a piece of rolled gold about 2 inches square, weighing about 5 pennyweights or even less, may be used as the anode. To this should be soldered a platinum wire about 4 inches long, by means of which the anode is connected with the positive electrode of the battery. An enamelled iron saucepan makes a good container for the bath. A gilding bath should be used at a temperature of about 130° F.

The articles to be plated must be thoroughly cleansed by means of the scratch brush and soap suds or stale beer. The scratch brush is composed of fine brass wires, and should be kept quite wet when in use. If there be the least grease on the articles they should be steeped for a short time in a hot solution of potash, containing about half a pound of caustic potash to the gallon. An acid dip is also used for some kinds of work. This is composed ordinarily of 1 part, by measure, of commercial nitric acid to 2 parts each of sulphuric acid and water. In this bath the articles should be immersed for a few minutes only. After immersion in either the alkaline or acid dip,

the articles in hand should be thoroughly rinsed in clear water. In coating articles made of brass or other alloys of copper it is the custom to plunge them in a "quicking" dip, which consists of a solution of mercuric nitrate or cyanide, of from 1 to one-tenth per cent. in strength. After this another rinsing is necessary. In using Watt's solution this quicking is said to be superfluous.

Having thoroughly cleansed, "quicked" and rinsed the articles, they should be hung in the bath by means of a copper wire, the free end of which is connected with the negative electrode of the battery by simply coiling it around the stouter wire several times. Both wires should of course be thoroughly cleansed. It is advisable to frequently move the articles about in the bath and to change the position of the wires supporting them occasionally to secure an equable deposition of the metal.

Watt's gilding solution is made by converting $1\frac{1}{2}$ pennyweights of fine gold into chloride by means of nitro-hydrochloric acid, dissolving this chloride in half a pint of distilled water, precipitating with ammonium sulphide, washing the precipitate and dissolving it in a strong solution of potassium cyanide, and diluting to make 1 quart. Before using, the solution should be maintained at the boiling point for half an hour, the loss by evaporation being made up by distilled water, and, as before stated, it should be worked at a temperature of 130° F. This solution does not require the previous use of the "quicking" dip.

The solution of chloride of gold may also be precipitated with solution of potassium cyanide, the precipitate washed and then dissolved by the addition of potassium cyanide solution and finally diluted. In precipitating the gold, care must be exercised, since the cyanide is soluble in an excess of the precipitant.

The silver plating solution most generally used is also a cyanide solution, and is made, as directed above, for the solution of cyanide of gold, save that the nitrate instead of the chloride of the metal is used as a starting point.

Many variations are made in the character of the solutions used and in the methods of manipulation, but the information given above will convey a general idea of the usual course of procedure.

Hypnotism in Dentistry.

I see in December *Items* an article on "Scientific Hypnotism." For the benefit of practitioners who may yet be skeptical in regard

to the effect of hypnotism, I give the following account of an incident which occurred in my office a few days ago:

A young lady accompanied by a friend (a hypnotist), presented herself at my office for the purpose of having two fillings inserted; one cavity in a lower molar, and the other high up in the labial surface of an upper lateral. At previous sittings I had found her teeth very sensitive, and at this sitting, found the lateral exceedingly so. She decided to have but one filling—that in the lateral—inserted that day. When I was ready to begin the operation, the hypnotist presided over the patient for a few minutes, and the patient became, apparently, unconscious. At this juncture he insisted that both the cavities be filled at one sitting.

I proceeded to excavate and fill the molar, using a Bonwill mechanical mallet. I allowed the mallet to make no noise, whatever, till I had placed the point of the instrument firmly against the filling, and had the machine in rapid motion. I knew that if hers was a case of *feigned* unconsciousness, the first work of the mallet, applied in the above manner, would make her give the hypnotic effect to the winds for an instant. But such was not the case. The filling was finished without a move on the part of the patient. In adjusting the dam to the incisor, it was necessary to put the ligature high on the neck of the tooth. This ordinarily painful part of the operation produced no evidence of pain beyond a slight contraction of the brow for an instant, and I had no evidence of any pain whatever during the remainder of the operation. The patient walked from the operation chair to a rocker, and after about ten minutes she was restored by her captor. She spoke of an appointment for the molar; when told that no appointment was necessary, she would not believe the cavity was filled till she had made an exploration with her tongue. She said she felt no pain whatever, and that she did not even know that any operation was being performed. While under hypnotic influence, any request made by the hypnotist was immediately obeyed by the patient, while my commands were entirely disregarded. If the cork prop became disarranged, nothing short of a command given by the hypnotist would separate the jaws.

While I know that complete anesthesia was present, I do not know whether to attribute the cause entirely to the effect of hypnotism, or that the hypnotist being an embryonic "D. D." was endowed with any supernatural power, or that it was a powerful mutuality brought about by the fact that the two expect to pull together in double har-

ness after the lapse of a few brief weeks. Each may judge for himself. —*J. G. Lane, Philadelphia.*

IS THE SIX YEAR MOLAR LESS PERFECT THAN THE OTHER TEETH? IF SO, IN WHAT RESPECT, AND WHY?

By C. C. Merriman.

Perfection refers to form and to structure. As to form, less imperfection can be found in the first molar than in any other tooth both as regards size and outline, being the largest tooth in the series, and as closely as any other conforming to its typical outline.

As regards structure, even our brief experience has shown us a marked inferiority to the other teeth in its power to resist disease. About two-thirds of all the teeth extracted in this college (U. of M. Dental Department) this year have been the six year molar. Dr. Taft places the proportion of decayed first molar at 37 per cent. of all decayed teeth. Analyzing tables given by Drs. Tomes, Hitchcock, and Magitot comprising about 35,000 cases of caries, find that considerably over 25 per cent. of all decayed teeth are the six year molars.

In looking for the cause of this defective structure the first thing noticed influencing this tooth is its early eruption.

The body of a child is not the miniature of an adult organism, but is characterized by peculiarities of structure and function. All its organs are incompletely developed but not uniformly so. The brain is, proportionately to size and weight, larger than in the adult, imperfect in structure and of softer consistency. The tissues generally are softer, more vascular, and more distended with fluids. The skeleton is, for the most part, cartilaginous, the muscles gelatinous, the cellular tissues are filled with serum, the skin vascular and sensitive. All the tissues at this period are in a formative condition, lacking strength and solidity, and characterized by the defects noticed in the first permanent tooth.

Deficient nutrition is that condition in which the quantity is inadequate to supply the natural demands of growth, the quality being normal. The result is a structure different in form or strength, but which, so far as is formed, is of healthy appearance.

The cause of this deficiency, as far as the six-year molar is concerned, is not that a less amount of nutrient material is in the system, rapidly formed and deposited; for the voracious appetite and vigorous digestion of the average six-year-old child would successfully dispute this; but that there is a demand made by every tissue in the

young body for more than its share of nourishment, and the first molar becomes more and more incapable of receiving its supply, and once formed must take its chances much as it is, while the other tissues are developing powers of resistance and the means of reparation of injury.

Not only are all the tissues demanding nourishment, but especially its neighbors on either side are being developed and require supply which is had only at the expense of the first molar.

Anatomically considered, no other portion of the human organism offers such a complex association of tissues as those of the mouth; no other has such diversified functions, and, from a pathological standpoint, no such significant systemic relations, and at the period at which the six-year molar is developed the jaws are crowded with teeth, both of the temporary series and the partly grown permanent set; vital activity and irritability is at its maximum, and the system generally, and the mouth especially, susceptible of injury and disease. After its eruption it is surrounded by tissues irritated by the pressure of the teeth below, the gums easily irritated and inflamed, the temporary teeth being absorbed at their roots are becoming less firm in their attachment, and in every act of mastication aggravating the trouble, so that the tendency is to avoid using them, depriving the new teeth of the exercise needed to strengthen and develop them.

Again, the tooth coming so early is popularly supposed to belong to the temporary set and its condition ignored till pain causes a visit to the dentist, who relieves the patient of both pain and tooth. This cause of defect in this tooth is more important than it at first appears. Were it confined to a few it would be immaterial, but continued through generations, as it is, and multiplied by inherited tendency, any organ will succumb to such usage.

The treatment received by the teeth of a six-year-old child will account for much of their trouble. He does those things which he ought not to do, and leaves undone those things which he ought to do. He will eat anything that is sweet, and chew anything he can call gum, but will not brush his teeth, nor, as formerly, will he allow his nurse or mother to do it for him.

THE

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EIGHTH (A) PAPER ON

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 107, Vol. 5, No. 4.)

HYPERTROPHY.

The pain caused by this affection is due to the enlargement, more or less extensive, of the cementum of the roots of the teeth. Severe pain is sometimes experienced from this condition, and, as there are no means of diagnosing it, the tooth causing the pain has to be extracted. This is often rendered quite difficult, accordingly as the deposit is greatly marked, as will be shown by Fig. 190 of these papers. The cause of hypertrophy is at present obscure. It is thought to be due to the taint of syphilis, or to some local irritation of the dental membrane, to mal-occlusion or to the absence of antagonism of the teeth. It is more frequently observed in persons of good organisms.

INFLAMMATION OF THE DENTAL MEMBRANE.

The pain caused by this may be the result of a blow, the sudden jar on the tooth as is caused sometimes in cracking a piece of ice between the teeth, or the sudden crushing of a piece of quill toothpick, but it is due in the largest majority of instances to the exposure of the pulp from the effects of decay.

The symptoms are at first pain on taking hot or cold food in the mouth, then a sense of discomfort in the tooth, with a desire to bite upon it, this biting causing temporary relief. After a time the tooth gets too sore to be bitten upon, and the jaws have to be kept apart to prevent the teeth from touching. The pain becomes more and more severe, the gums red and swollen, and the tooth seems to protrude from its socket. These symptoms may continue for several hours or several days, according to the organisms of the patients; those subjects with vascular bones getting relief soon, those of good

organisms slowly. Relief may be given by raising the bite, by protecting the affected tooth, in placing a plate gutta percha cap on the teeth on either side of the affected one, by massage to the gums over the affected tooth, or by painting the gums with tinct. aconite, tinct. iodine, chloroform, or a solution of hydrochlorate of cocaine. Should the pain be the result of particles of salivary calculus around the necks of the teeth, and extending on the roots so low as to cause the irritation of the peridental membrane, this of course should be removed. If the pain be caused by an inflamed pulp, endeavor to restore it to its normal state by the application of antiphilogistic remedies, such as tinct. aconite root, or tinct. iodine, painted on the gums with a small swab of cotton, or applied within the cavity, this having been cleansed of as much decayed tissue as possible. If the pulp does not recover its normal condition from this treatment, devitalize and afterwards fill the roots and crown.

ALVEOLAR ABSCESS.

As the name implies is an abscess in the alveolus. An alveolar abscess may be acute or chronic. It is a collection of pus generally at the end of the socket of the tooth and is encased or collected into a sack, of greater or lesser dimensions, by the peridental membrane, which has been forced away from the end of the root, causing an absorption of the bone to make room for it. It is the result of the inflammation of the peridental membrane, generally caused by the exposure and subsequent death of the pulp. In acute abscess the disease takes from 3 to 6 days to run its course, and is accompanied by the severest pain. The gums about the affected tooth are red, almost purple in color, and are tender to the touch. At times the disease is accompanied with shiverings, chills and fever, and the sufferings are so great that it invests the patient with feelings of dispair at the inability to obtain relief. Relief may be obtained drilling through the alveolar plate to a point striking the end of the root, so as to establish a vent or tract for the escape of the accumulating pus; but ordinarly the pain and soreness of the parts is so great that few can put up with this operation, when it may be said "that the remedy is worse than the disease." Besides, it may not positively be known if it be an "alveolar abscess proper" or a "traumatic alveolar abscess." The former term implies when the abscess occupies the "apical space," the latter when it occupies a place on the side of the root. This *may* be determined by striking the tooth directly on a line with its long axis, or striking it at different angles and determining, by the report of the patient, which blow gives most pain. Should

it be the former, it is due to abscess in the apical space, if the latter, to "traumatic abscess." But even this test is not always to be relied on, because the parts are so intensely sore, that the responses of the patient are not reliable. All that can be done is the application of warm substances *on the gums over the affected tooth*, or the application of roasted raisins, figs or onions to the parts. The painting of the gums with tinct. aconite root, tinct. iodine and chloroform in equal parts, the application of capsicum bags, mustard plasters, or cantharidal collodion to the gums, so as to blister, leeching, lancing the gums to relieve the conjested condition, the drilling through to the apex of the root, in the effort to make a vent for the escape of the pus, or as a *dernier ressort* the extraction of the tooth. While the pus, in its effort to make its escape by establishing a fistulous tract, is making its way through the alveolar plate, which is of denser bone than that in the neighborhood of the apex of the root, and as a consequence offers greater resistance to the escape of the pus, the pain is of a throbbing nature. The gums at this time are very red and are puffed and thickened with the congested blood. The parts begin now to swell, and, as a rule, when swelling begins the pain gradually decreases. The eye is sometimes completely closed, the cheek increases to an enormous size, and is so red, sometimes, as to be mistaken by many physicians for erysipelas. The jaws are stiff and the muscles rigid, so that the mouth can scarcely be opened. When there is a pointing on the gum, indicating the location of the abscess, the confined pus should be liberated by a puncture with an abscess lancet The escape of pus will be instantaneous if the puncture has been well directed, and frequently as much as a tablespoonful of pus will purge out. If the patient can insinuate the finger in the mouth, he should press the parts gently all around the puncture, so as to get rid of as much pus as possible, which, of course, should be expectorated. The pain now gradually and greatly abates, and the swelling subsides in one or two days.

It is seldom that an acute abscess, which has established a fistula for the escape of the pus, heals of its own accord, yet cases are on record of their doing so.

When an abscess fails to establish an outlet or external fistula, it is termed "a blind abscess," and when this condition exists it becomes chronic, and is frequently the source of discomfort and uneasiness.

An abscess may establish a fistula at points more or less remote from the seat of the trouble, thus it may perforate and lodge in the "Antrum of Highmore," in the "Nares," in the "Throat," in the

"Soft Palate," in the "Orbit," and sometimes on the "Scapula," and on the "Chest" as low down as the "Nipple."

In chronic alveolar abscess the symptoms are much the same, only that its termination may result more disasterously. Thus, exfoliation or necrosis of the bone may result from chronic abscess. The treatment in either form should be prompt. A fistulous opening should be urged by the application of capsicum bags and all such treatment as was advised for this end in the acute form. Quinine and Dover's powders are indicated at night and cooling purgatives in the morning. As soon as quiet is obtained, the roots should be opened and cleansed, and antiseptic, detergent and tonic treatment begun, and continued until health is restored. The probe should pass through the apical foramen, and the medicines used in the treatment made to pass through and attack the seat of the disease. The use of Dunn's abscess syringe, Fig. 151 A, is perhaps one of the most useful implements to this end. Its mode of application is well shown in Fig. 151 B. An opening is made into the root. The syringe is charged with the disinfecting or antiseptic medicine, one of the small rubber cones C is passed over the needle D and placed at the entrance of the root

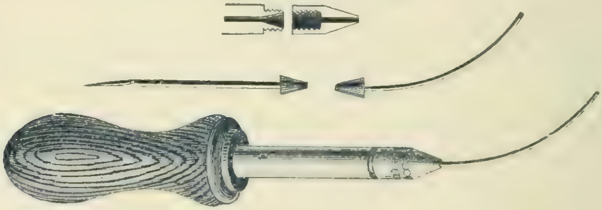

FIG. 151 A.

canal. This is held in place and made to entirely fill the aperture, by pressing on it with another instrument, as shown by E. The bulb

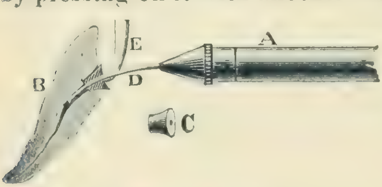

FIG. 151 B.

is then gently pressed until the medicine is forced through the foramen of the root and into the pus sack and along the track of the abscess. This treatment is continued until the pus secreting membrane is broken up, and fresh healthy granulations spring up. Pus is considered to be morbid white corpuscles of the blood. It is generally of a whitish yellow color, creamy in consistency and opaque, being the product of suppuration. It is generally defined as healthy or laudable pus, in which condition it is inodorous and inoffensive, and non-irritating to

the tissues in which it is in contact, or rather it is tolerated by them. Bad pus is offensive, ichorus or watery, dark, fœtid, greenish, mixed with blood and irritating. When pus of this kind is noticed care must be taken lest it lead (if it has not already done so) to exfoliation and subsequent necrosis, as pus from dead bone is always offensive. When pus is lodged in the antrum there is always a sense of fullness or weight or both.

NECROSIS.

By *Necrosis* is meant the death of a bone. It is used to indicate the death of *bones* the same as *Gangrene* is used to indicate the death of the *flesh* or soft parts. Necrosis is brought about by the death or disorganization of the periosteum. Bone derives its vitality from the blood, supplied through the periosteum, so that when this supply is cut off, death ensues to the area which is thus deprived, in the same manner as death ensues to the general system from starvation, or from cutting off of the supplies necessary to life.

When this supply is cut off from any part or area of bone, an effort is made by nature to stop its extension, so that the dead bone is first exfoliated or thrown off.

The inflammation and death of the periosteum of the alveolar processes is the cause of necrosis of the jaw, and is due sometimes to dental irritation, and sometimes to the long and immoderate use of mercurial medicines, bilious fevers, syphilis, small-pox, etc., or it may be the result of the injudicious use of arsenic for the dentalization of the pulp.

The treatment consists in the removal of all the disorganized tissue, the application of Larbaque's solution of chlorinate of soda, great cleanliness of the affected and surrounding parts, with warm water or slightly salted warm water. The offensive odor, inseparably connected with necrosis, may be corrected with a wash of warm salted water, or listerine and water. The diseased parts should be freely syringed with a dilute wash of aromatic sulphuric acid, and all the parts kept scrupulously clean. The teeth about which the alveolar plates have exfoliated should be removed, but this is not always necessary, as the necrosis may only have extended to the outer plate, and when this has been removed by suitable forceps the remaining parts may be restored to health by proper treatment, and the teeth still preserved intact. Caudy's wash, a wash made with the permanganate of potash, or Phenol sodique weakened with water are all useful in the treatment of necrosis after all the necrosed bone has

been nipped off. In the meantime the system should be sustained by proper tonic and stimulating medicines.

SHOCK.

Shock may be induced by the patient being kept too long under the strain of dental operations. This may be due to the dentist desiring to do too much and keeping his patient too long in the chair, or to the patient overtaxing his or her strength in the desire to get through. No appointment should be made for a longer time than *one hour*. *Two hours* is sometimes permissible, but to extend an operation for over *three hours* should never be done. If it be found that an operation will consume a long time, it is better to divide it into several appointments. Thus if it be a case of root and crown filling it may be well at one appointment to cleanse and fill the roots, and at another to fill the crown. Much time may be saved by filling teeth requiring very large contour operations with the phosphate of zinc, and afterwards covering this with gold, by drilling retaining pits into it. Such operations are better for the tooth, as it is strengthened or better supported by the cement than by the gold, they are better for the patient as it does not put them to so much strain as a large operation, and they are better for the dentist, as he too is not subjected to so long or tedious an operation. In another case the cavity may be prepared, and filled temporarily with gutta percha, and at the next appointment the gold inserted. This may always be done in a *city practice*, but in the country, where the patients may have driven several miles to seek the dentist's services, the case is different. In such cases it would be well, if it were found that what was actually needed would consume *five hours*, to give a sitting of two and a half hours, then to give the patient a rest of two or three hours, and then take the case up again for completion. In this way the shock or strain is to a great extent aborted.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

BY THEODORE F. CHUPEIN, D. D. S., PHILA., PA.

Q. Are the Maxillary bones as liable to disease as the other bones of the skeleton?

A. They are.

Q. Whence does a bone derive its nourishment?

A. From its periosteum.

Q. When this membrane becomes diseased, or disconnected with the bone, what results?

A. A loss of vitality, or death.

Q. What term is used to signify this?

A. Necrosis.

Q. Does this death affect the whole bone?

A. No. Only a circumscribed part; as, for instance, a single alveolus or socket, or several of them, accordingly as the severity of the disease affects a lesser or a greater area.

Q Is it more likely to affect the upper or the lower jaw?

A. It may occur in either jaw, but more liable in the lower than the upper.

Q. When the disease has been arrested by proper treatment, is new bone formed to replace the lost portion?

A. No. Because, as the periosteum, which is the bone-forming membrane, is destroyed, new bone cannot be replaced, yet cures are on record where the large part of the lower jaw, which had been destroyed by necrosis, has been restored.

Q. Does Nature make no effort to arrest this disease or loss of structure?

A. Yes.

Q. What is this this effort of nature termed?

A. Exfoliation.

Q. Can you describe this process?

A. It is thought that an inflammation of a suppurative nature is set up, and that a corrosive fluid is eliminated or secreted from the vital periosteum adjoining the diseased part

Q. Is there any indication in the gums covering the necrosed bone?

A. The gums loose their connection, and become soft, spongy and have a dark bluish color, and are exceedingly sensitive, and bleed from the slightest touch.

Q. What is the cause of necrosis?

A. A death of the periosteum from the effect of inflammation, (regarding the maxillary bones) due to dental irritation. Or it may result when the system is highly charged with mercurial medicines, during a spell of bilious fever, small pox, syphilis, etc., etc. It may result from the careless use of arsenic for devitalizing teeth, improper treatment of the roots of teeth upon which crowns are set, severe or sudden blows, etc.

Q. Is the disease brought about in no other way?

A. Yes. It may result from the inhalation of, or exposure to, the fumes of Phosphorous, and is then termed *Phosphor-Necrosis*, as is witnessed in the operatives employed in match factories.

Q. How does the disease affect the bone in such cases?

A. Generally through a decayed tooth, or may be through the alveolus of a tooth recently extracted.

Q. Are there no precautions used to prevent this disease?

A. Yes. A careful examination of all the teeth is made, by a competent dentist, before such operatievs are accepted or employed in such manufactories, and the operatives are compelled to wash the mouth frequently with such washes as will neutralize the corroding effects of the phosphorous.

Q Are there any indications of this disease?

A. Yes. There is a peculiar doughy look about the skin, and the cheeks are puffy, with considerable pain about the parts.

Q. Does this disease follow the same indications?

A. No. There is no separation of the sequestruum, as in the other form of necrosis, but the dead bone becomes coated with a material like pumice-stone, which adheres to it very firmly. Abscesses form and discharge through the cheek and leave fistulous openings for the escape of the matter.

Q. How is necrosis treated?

A. One of the principal aids to cure is excessive cleanliness of the affected parts. The entire removal of the sequestra or dead bone. The application and continued and frequent use of Larbaques solution or chlorinated washes.

Q What else is recommended in such cases?

A. The odor from necrosis is extremely offensive, as well to the patient as to the operator, and the taste to the former is sickening in its effects from the discharge of pus and fetid matter; these may be corrected in a great measure by the free use of salt and water, and a diluted solution of aromatic sulphuric acid, combined with a little tincture of capsicum. Listerine is also used successfully. All of the diseased parts should be freely syringed with tepid water.

Q Is it necessary to remove the teeth about which the bone has died?

A. It is not always necessary to do this, and their removal may only be resorted to when the disease cannot be cured otherwise.

Q. Why is this?

A. It frequently happens that necrosis only affects the outer alveolar plate of bone, and when this is removed new bone may be produced, throwing off sufficient support to hold the teeth in position.

Q What other agents have been recommended to correct the odor emanating from necrosis?

A. The permanganate of potash, solution of carbolic acid, chlorinated soda, solution of iodoform, etc.

Q. Carbolic acid will not mix with water; how do you make a solution of carbolic acid?

A. The carbolic acid is first mixed with glycerine, after which the water is added.

Q. What treatment is recommended for the patient who has undergone this operation?

A. He should be nourished with good strengthening food, and tonics administered.

Q. How is the dead bone removed?

A. The bone is removed with cutting forceps. When it is thrown off by exfoliation, the parts are removed with tweezers or small forceps. "Should the removal of a small portion of the bone of the jaw be requisite, it is seldom necessary to interfere with the skin, or make an external incision. The whole of the lower jaw can be removed in this manner by dividing it at the chin, and after separating all the attachments of the soft parts with the knife, drawing out each half at a time."

Q. Are the maxillary bones subject to any other disease?

A. Yes. There is noticed a gradual absorption or destruction of the alveolar walls.

Q. Is the disease attended with any pain?

A. Sometimes; but it is generally so slow, extending through many years, that little inconvenience is experienced.

Q. Where does the disease first manifest itself?

A. On the labial surfaces of the cuspid teeth (frequently the upper ones) and on the palatal roots of the upper first and second molars.

Q. Can it be strictly termed a disease?

A. The condition is so slow, and is attended with so little (if any) inconvenience, that it may be regarded more as a wasting away, incident to advanced life; especially as it is more frequently observed in subjects with good teeth and good constitutions.

Q. Do the teeth loosen from the effects of this gradual absorption of bone?

A. Sometime, although it is frequently noticed that the absorption may advance to such an extent that an instrument may be passed freely through at the bifurcation of the roots, and yet the teeth remain perfectly firm.

Q. Is any pain experienced when the gum and bone have left the teeth to this extent?

A. Yes. Pain is experienced in taking hot and cold liquids in the mouth.

Q. How is this accounted for?

A. The nerve passing through the foramen at the end of the root is so slightly protected by the integuments that these variations of temperature cause pain.

Q. What is to be done for relief in such cases?

A. Should the tooth have no antagonist it may be extracted; or if very loose it may also be extracted; but should it be firm in its position and have an opposing tooth which would make it serviceable for mastication, the nerve should be destroyed.

Q. Is there any other source of discomfort in the molars thus affected?

A. Yes. The tissues having left the neck of the tooth to such an extent as to permit the roots to be exposed above, where they bifurcate, food is frequently forced into these spaces in the act of mastication; and as it is almost impossible for the patient to cleanse such place, such teeth give much discomfort, both from the impaction of food and from the odor incident to its decomposition.

Q. What is to be done in such cases?

A. Extraction.

Q. Is this condition only noticed in advanced life?

A. No, it is observed sometimes in middle life, also.

Q. What is the cause of this disease?

A. The cause has not been definitely ascertained. Some attribute it to the natural causes of advancing life, others to fungous formations which are found around the parts involved; still others to the presence of micro-organisms, and to peri-dental inflammation, arising from a gouty or rheumatic diathesis.

Q. What is the treatment?

A. Should the recession of the gums be due to the accumulation or deposit of tartar this should be removed. Tonic mouthwashes or astringent washes may be employed, and a mixture of tinct. iodine with a small quantity of glycerine and carbolic acid may be used to paint around the necks of the teeth. The internal administration of lime water is indicated; while dentifrices combined with powdered borax and powdered castile soap should be *frequently* used.

Q. What do you mean by necrosis of the teeth?

A. It is understood to comprehend the death of the entire crown and nerve canal of the roots of teeth.

Q. Is there any difference in the efforts of the economy regarding necrosis of the bone and necrosis of the teeth?

A. Yes. In the case of necrosis of the bone an effect is sometimes made by nature at recuperation, whereby new bone is thrown off to supply the loss occasioned by the disease; but in the case of the teeth we do not find such recuperative powers and the dead organ has to receive surgical or medico-dental treatment to effect a cure, or prevent the loss of the tooth.

Q. Is not a dead tooth thrown off by nature?

A. No. It is retained, although not receiving its regular nourishment, by a circulation which is kept up through the peridental membrane that invests the cementum which covers the outside of the root.

Q. Is a tooth thus necrosed affected to any extent?

A. It is affected as to its appearance, the tooth losing, by its death, its translucency, becoming more or less dark, or opaque, according to its density.

Q. Is its usefulness impaired by its loss of vitality?

A. It does not seem to be. It is just as hard or dense as it was before and is not more liable to decay. It may be filled and rendered serviceable for many years, although deprived of its vitality.

Q. What causes the death of a tooth?

A. It is most frequently caused by decay encroaching to and causing the death of the pulp—its source of nourishment—from exposure, or it may be caused by a violent blow or fall.

Q. Is the discoloration or opacity of a dead tooth different when the necrosis is due to the death of the pulp or when caused by a blow?

A. The discoloration is more pronounced when the death has been caused by a blow.

Q. To what is the opacity due?

A. To the presence of disorganized matter from the dead pulp, which infiltrates into the tubuli of the dentine.

[TO BE CONTINUED.]

HOW A MEDICAL FRIEND EXTRACTED TEETH FIFTY YEARS AGO.

BY THEODORE F. CHUPEIN, D. D. S., PHILA., PA.

I recall, with many a smile, what I have often related of the manner which Dr. M——, a very popular and successful physician of Charleston, S. C., used to extract teeth fifty years ago.

At that time there were comparatively few dentists established for the practice of dentistry, and the rule was that if a tooth ached there was nothing to be done but "to have it out."

The doctor did not practice dentistry, but he had quite a run in the matter of extractions.

No operating chair embellished his waiting room, in which the operation was performed.

His assistant was a big burly muscular negro, who drove his visiting carriage.

When patients presented for the extraction of a tooth, regardless of sex, they were requested to lie on their back on the floor, (which was not even carpeted.)

The doctor straddled the patient and applied the forceps to the aching grinder, while "Sam," the assistant, knelt at the head of the patient, facing the doctor, and applied the palms of both hands on the sides of the head, at the parietal bones.

When the doctor was ready to "pull" he cried out lustily, "Press!!!" when forthwith Sam did press the head as if he would crush in the skull. The pain from the pressure exerted by Sam often dazed, or rendered the patient almost unconscious, which overcame the pain of extraction inflicted by the doctor, so that

"Uninjured from the dreadful close,
Nearly breathless *all three* arose.

It may be said, in card parlance, that between Sam and the doctor "Honors were easy."

CORRESPONDENCE.

ANDOVER, Mass., July 9th, 1891.

EDITOR OF THE DENTAL OFFICE AND LABORATORY.—Dear Sir: In reply to your hint in regard to Thermometers, in the July number of your journal, I herewith submit my plan of procedure.

When the column of mercury becomes divided heat the dry vulcanizer until the mercury fills the tube; as it cools it will be found to have coalesced perfectly. This is a simple and sure method of overcoming the difficulty.

Yours truly,

C. H. GILBERT.

SULPHURIC ACID FOR TREATING GUMS.

DEAR SIR.—In compliance with your request, I will make known to you—and you are the first—how I was first led, or induced, to take hold of *sulphuric acid* as a remedy appropriate for treatment of teeth

and gums. I will explain by making a brief statement of facts pertaining to my early practice :

In July, 1854, as well as I can recollect, I was practicing in Goldsboro, in the eastern section of the State, and was called upon by a stranger who had stopped in the town for a day or two, and who desired to have his teeth cleansed. I was just then finishing an operation of cleansing for a lad of sixteen or seventeen years of age, whose teeth, front especially, were coated with what is known as green tartar, or green stain. I had appropriated an hour or more to the operation, using old appliances, such as were then popular and favorably endorsed by the profession--stick, pumice and water, argillaceous tooth polisher, etc. And when I was through with the operation my patient's teeth did not look as though the job had been well done. But it was the best that could be done under the circumstances (practice of that day considered). When the patient left the office the stranger of riper years took the chair. I examined for tartar, and detected a small quantity, which I decided to remove before proceeding to cleanse or whiten the teeth. The custom then was to remove tartar with sharp-edged scalers, large size and very sharp. Some persist in doing so now. After removal of tartar I prepared for cleansing the teeth, and was careful to place my family remedy or implement, argillaceous tooth polisher, where convenient to get hold of. The patient picked up the polisher and carefully examined it, and said : "Doctor, are you going to use this on my teeth ?" I replied I was if I found it necessary to do so. He objected, and requested that I would only use the stick and pumice with *acid*, if I ever used it. "What !" said I ; "put acid on the teeth ? By no means if I can accomplish cleansing with anything else." Said he, "Then if you are opposed to the use of acid, proceed with stick and pumice," which I did, and in half an hour's time mnde quite an improvement in the appearance of his teeth. He seemed to be satisfied, but remarked : "Doctor, I think if you would discard prejudice and commence using acid you would save a great deal of time and do better service for your patients. And you would not injure the teeth as much as you do with some of the articles you use."

It put me to thinking. I asked if he was a dentist. He said no, but he was a chemist, and was familiar with the properties of acids. Then I asked what acid he would use and how. He said none but sulphuric acid, which was harmless when applied to the teeth. The next query was, how to be applied and what strength. He said : "Half and half—acid and water—and to be applied with a soft pine

stick, or a stick of any other soft wood, shaped at point to suit, and to be careful not to let the acid touch the gums if I could avoid it." I thanked him for the information and asked his name. He gave it, but I can't call to mind now what it was, but Perry, I think.

This was my first information and intimation as to the use of acid. I very soon procured some acid, and commenced experimenting, and concluded it would be best to deal cautiously with the article, and not use it as strong as was advised. I commenced with a solution of one of acid to eight of water and obtained most satisfactory results.

For six or eight months I confined myself to the use of soft pine sticks in applying the remedy, during which time I varied the strength. On several occasions I ventured to use, as advised, half and half, then again reduced as low as one to twenty-five or thirty with favorable results. All the while I was careful not to let the acid touch the gums, fearing bad results.

One day I had a troublesome case and was pressed for time. I concluded to try the use of a hair tooth-brush with a weak solution, and take the chances of injury to the gums, and with the brush, instead of the stick, I accomplished all I desired in the way of cleansing in less than three minutes. The gums were much diseased and bled freely. The patient complained heavily and wanted to know what I had used. I waived answer, and said all would be right to-morrow, but requested that. in the event of increased discomfort, to return without delay that I might do something for his relief, and especially requested that he would call by noon next day so that I could administer further treatment if necessary. He did not return, however, until the third day, when I almost feared to see his gums, doubtful as to the effect of the acid. But, to my surprise and delight, I found the gums greatly improved in appearance, and he was well pleased and feeling quite comfortable, said his gums felt better than they had for months. He insisted that I should tell him what I had put on his teeth and gums, but I declined to do so, fearing the consequences if he should "blow on me."

This case of *scurvy*, as such derangement of the gum was then termed, was my first experience of good results from the use of *sulphuric acid*, *pumice and tooth brush.* I presumed on the result of this single case, and commenced a series of heroic experiments, and very soon, without fear of injury to teeth or gums, established the practice now advocated.

I could go more into detail and try to interest you on the subject, but have extended this letter of explanation further than I anticipated.—*Dr. B. F. Arrington, in Dental Headlight.*

PYORRHEA ALVEOLARIS.

There is a frequent departure from health, called pyorrhea alveolaris. It first involves the loss of the dental ligament which unites the gingival margins to the necks of the teeth and the alveolar plates, and requires vigorous and persistent treatment to overcome the downward tendency of the nutrition of the parts and induce new granulations, by which lost tissues may be replaced. Dr. Riggs, who called special attention to this disease in his earlier practice. advocated mechanical cleansing as the only means necessary for restoration; but later he acknowledged there was something more necessary than simply removing foreign deposits and breaking up adhesions of a morbid character. This is a form of local deterioration that yields to escharotic treatment and constitutional tonics and depuratives much more readily than is generally accepted by medical men and dentists. The proper treatment is to use some agent that will dissolve the dead and dying part of the tissue so as to set up a line of demarcation between the diseased and the healthy structure, so as to throw off by exfoliation what would be a scab, if it were external, where it could dry down. Compound aromatic sulphuric acid, in full strength as it comes from the pharmacy, is a remedy which, when faithfully employed, has brought about restoration in a kindly manner. Caustic paste is a more active and powerful remedy, and in judicious hands is to be preferred. When a series of pockets are present there should be a fixture attached to the teeth, leaving room for the granulations to grow up inside, which they will do when protected from foreign matter, finding lodgment there to set up the deteriorating process and to destroy the granulations, thereby preventing the reproduction of the gums first, and of the alveolar plates subsequently, which follows, when it is faithfully kept in good condition by constitutional remedies, hygienic exercise and exposure to pure air and sunlight, which should always be invoked where the patients are able to leave their rooms.—*Dr. Wm. H. Atkinson, in Southern Dental Association.*

WHY DENTISTS DON'T DIE RICH.

We happened to be glancing over a trade paper, some time since, and read an editorial regarding the unprofitable manner in which some conduct their business. We have plagiarized the article, but altered it slightly to fit the dentist's side of the question.

In the foremost ranks of unwise men should be placed those dentists who so far ignore business principles and the spirit of fair deal-

ing as to take work at prices which will not properly pay. If a truthful history of dentistry in this country for the past ten years or more were to be written, it would be punctuated by many instances of disaster overcoming those who have striven to increase their business without taking profits into consideration. Suppose a dentist has $5,000 invested, which includes his pupilage, college expenses and office outfit. Judiciously placed in bonds or other securities, this sum would realize for the investor, say $250 per annum. His services, if employed by others, ought to increase his income to $1,000 or thereabouts. In business for himself, this earning power of his own labor and capital ought never to be lost sight of. Then add ten per cent. annually for depreciation in the value of his office; $300 for rent; $500 for stock; $150 for repairs, heating, and exceptional expenses, and he has a total of $2,450, entirely outside of living expenses, which he must consider in making estimates. That this is not an exaggeration every dentist who is honest to himself will admit; but how many there are who disregard their own interests, and slash prices at the instigation of that unconscionable devil, Competition, to the extent of self-robbery. However annoying it may be to lose old patients, or whatever the gratification of keeping business from a competitor, it is silly, senseless, and suicidal in the end, to wear out brains and muscles in the effort to hold or gain profitless patronage.

It is wiser, by far, to do a small and profitable business, looking for patients among those who can appreciate good work and are willing to pay fairly for it, than to fall into the bad way of exchanging an old dollar for a new one, simply to keep yourself employed. The latter course is a losing game and an injustice to the patient, to one's self and to competitors. And patients do not appreciate you the more for low fees. They rate you by your fees and the fidelity with which you earn them.—*Ed. Dental Advertiser.*

ARTICLE VI.

SOME PRACTICAL SUGGESTIONS ABOUT PLASTER OF PARIS.

By Rodrigues Ottolengui.

The columns of our journals are more often given up to operative dentistry, or to theoretical discussion of supposed to be scientific matters, than to the every-day needs of the worker at the laboratory bench. We visit our neighbor and he takes us cheerfully into his office, but infrequently invites us into his work-shop—perhaps because it is dirty. Thus by association we learn more about each other's methods at the chair than we do of what we once called mechanical

dentistry, which nowadays is too often relegated to inexperienced students or assistants. Whatever I do for my patients, I do with my own hands. Every dentist should be able to say the same, or at least to do the same. If anything presents which my hands could not accomplish, I do not hesitate to recommend my patient to the proper specialist, rather than to hire said specialist to come in and do the work surreptitiously, taking the credit myself. But this is not practical talk, which my title promises.

In Philadelphia, once, I heard Prof. Essig say that he doubted if there were more than five men in Philadelphia who knew how to mix plaster. A sweeping assertion, which was however probably correct. Though at the moment in that city, I could not at that time have contended for a place among the learned five. What I know on the subject now is due to my association with Dr. Kingsley, who, perhaps, has no superior in the manipulation of this material.

First, then, for a few facts: Plaster will set more rapidly if tepid (not hot) water is used, than if we take cold. A clean smooth cup is the most convenient vehicle in which to mix plaster, rubber bowls being especially unsatisfactory to one who has become accustomed to the thin cup. New cups should be obtained as often as the surfaces become checked so that the plaster is difficult to remove. If an excess of material has been used, scrape it out into the waste box, and what little there is left in the cup will easily come away when hard by filling the cup with water.

To mix plaster, put in the cup at the outset about as much water as judgment indicates will be needed. To add water later is a mistake. Drop in the plaster a little at a time, allowing it to disappear below the surface before adding any more; repeat this till the plaster protrudes above the water, which refuses to take up any more. Then stir vigorously with a smooth *clean* knife and a mixture moderately stiff and perfectly smooth will reward you. The more it is stirred the more quickly it will set, and the stiffer it gets. Use it for the purpose in hand when it has reached the required consistency. If on mixing it is found that a miscalculation has been made as the mass is thin, do not add more plaster; such a step will ruin everything. Pour off any excess of water, and then stir till stiffening begins. Mix enough plaster at the outset, because to mix a second batch, especially in flasking, gives a mass one part of which will set sooner than the other, which is often very undesirable. In taking an impression of a large surface, this sometimes becomes necessary. Then mix the first batch quite thin and flow it over the entire surface of

the object of which a duplicate is desired. Then add other plaster until the impression is as thick as needed. By the time the last lot has set, the first will usually be hard, and all will be well.

In mixing for impressions of the mouth, use fine plaster, add a little salt and a little powdered pigment; Venetian red or Spanish brown serve admirably. This will produce a thick setting tinted impression material, which can be readily detected from the model which is to be poured into it. The plaster must be fixed as described, care being taken not to have it too thick. Do not stir until in the presence of the patient.

Then stir until it can be felt that the mass has begun to stiffen. Fill the cup rapidly, carry it to place firmly and hold it there motionless. If there is a high roof put some plaster in the valut with the knife. If it is feared that the buccal portions of the molar teeth may not be reached, place plaster there also, before inserting the tray. As soon as the plaster begins to set in the cup, chop it up so that it may be more readily removed when the cup is to be cleaned. As soon as the material in the cup will fracture sharply, remove the impression regardless of possible fracturing. If this does occur, collect all the pieces from the mouth; they may be replaced so as to form a practically perfect model. I have made up an impression from thirty odd pieces and secured good adaptation.

To procure a lower impression, put but little plaster in the tray, place plaster around the teeth in the mouth with the knife, being sure to cover all surfaces of the teeth; then quickly insert the tray and let the mass harden, and remove as before. In very difficult cases, where the teeth are long and perhaps loose, dispense with the tray altogether. When the material is sufficiently set, split it into sections with a sharp pen-knife, and afterwards join the fractured pieces together as before.

To pour a model, use a shaving brush, and with soap-lather thoroughly soap the surface of the impression, especially in the pits for teeth, and be careful to wash all the suds off afterward; otherwise the surface of the model will be pitted. Mix the plaster moderately thin. Have the surface of the impression saturated, and a little water in the pits for the teeth. Start the plaster into the last molar and let it fill up and run over into the other pits, forcing out the water ahead of it until all are filled. Then turn the impression over and shake the plaster out of the impression back into the cup. This insures a thin film of plaster over the entire surface. If the process is now repeated and the impression slowly built up without turning it over, the result will be a most accurate model.

Where the model is to be used for gold work, and dies must be made, if there are any teeth present, a pin should be placed in each. In doing this cut the heads off, and later the plaster teeth may all be broken off, the pins withdrawn, the dies made, and the teeth readily turned to position, where they may be again fastened by using a camel's hair brush and plaster very thin. In repairing models in this way, take a saucer with a little water and drop in a little plaster, but do not stir it. The plaster may be taken up with the brush placed along the joint between tooth and model, and as it soaks in the excess must be wiped away with the brush filled with water.

When it becomes desirable to trim a model, after it has lain around a day or two, and so become quite hard, dip it in water for a few minutes, and it may be readily cut with a sharp pen-knife. If an impression is filled and allowed to stand over night, drop it into hot water, and the steam generated will make separation more easy. Models should always be well soaked before more plaster is added to them. If, however, it is desired to preserve a model, upon which a plate is to be vulcanized, it may be readily done by soaping it slightly and flasking it as dry as possible. With care, after vulcanization, the investment may be removed without injury to the model, which, if then allowed to dry, may be separated from the plate.

To mix plaster and sand for investment of gold pieces, drop sand into water, and without stirring pour off as much water as will run out. If now halt the quantity of plaster be added, vigorous stirring will produce a mass of the proper consistency. At first it will appear stiff, but by stirring the sand will soon yield enough water to saturate the plaster. when the whole will become incorporated.

Never varnish plaster under any circumstances, except for moulding in sand.—*Dental Mirror.*

GOLD CROWNS AND BRIDGE WORK.

I wish to call your attention to a few thoughts in relation to the preparation of roots for Gold Crowns and Bridge Work, and a novel way of attaching these appliances.

I have had considerable experience in the making and attaching of these, and will first speak of the failures I have noticed, which have been chiefly on account of improperly prepared roots and in a failure of the material with which they were attached, failure is always a valuable lesson in achieving success if the causes are properly studied.

EASY METHOD OF GOLD CROWN AND BRIDGE WORK.—My method

of procedure is as follows : After all the carious matter has been removed the nerve cavities are filled with cone-shaped silver wire cones, which project above the gum line to any required length. The silver wire cones are first covered with a thin coating of soft amalgam and are sometimes barbed and driven in place by a few light taps of the mallet, after which amalgam is packed around them till the root is restored to such contour as may be desired. After the amalgam has consolidated, say at another sitting, any further modification of the root may be attended to. A root built up straight or very slightly cone shaped is the best form. There are many devices for getting the measurement of the root for making the gold collar which fits at and under the gum. I now do no fitting of gold bands in the mouth, but rely wholly on a metal cast. An impression of the root is taken in modeling compound which is thoroughly chilled before removal from the mouth. An articulation is taken with wax, a plaster model is made from the impression, the cast is trimmed away at the cervical border to allow the gold band to pass under the free edge of tne gum and up to the alveolar border. A metal cast is then made of fusible alloy by first imbedding the plaster cast in the fused alloy ; after removal of plaster, a model die is made by pouring into the counter model ; in this way you have a fac simile of the plaster cast in metal, to which the gold plate, which is to be used in construction of the crown, can be applied ; the metal cast and wax articulation is now placed in an articulator, and you can proceed just as well as if the patient was present.

If the crown is carefully made no alteration will be necessary, and it is ready to be applied to the root. I have on several occasions made bridge pieces by this method, which were never tried till completed. On one occasion, a gentleman of this city, while away on a business trip, was troubled with an aching second molar. In an attempt to have it extracted it was broken off even with the process and the pulp left exposed, He immediately returned to the city, and we treated the root, built it up, as I have described, and placed a gold crown in position, which has given satisfaction.

About two years ago I was talking with my friend, Mr. T. A. Long, of Philadelphia, about cements. After reflection he suggested the use of Hill's Stopping as a material for setting gold crowns and bridge pieces which would not disintegrate nor be affected by the fluids of the mouth, the only trouble was the great heat required. It was a happy thought—I acted on the suggestion, and have never had a failure when it was used. My method of using it is : first have the root

thoroughly dry, and coat with a thin solution of gutta-percha in chloroform, dry with hot air, warm the crown with a sufficient amount of the stopping inside to proper consistency, and then place into position *rapidly* with hand pressure. An opening should be made in the crown for escape of excess material. When the crown is in position chill thoroughly with ice water, after which fill the opening in the crown with gold wire or foil,

My first use of this material was in setting a bridge of eight teeth. Patient returned in a few months with one of porcelain fronts on a bicuspid broked. I tried in vain to remove the appliance—used chloroform, hot air, hot forceps, hot water, and every device I could think of, but to no purpose, it could not be moved, and, as I did not want to cut the appliance to pieces, I was forced to make the repair in the mouth. This material has proven so very satisfactory in my hands that I can certainly recommend it.—*Dr. B. O. Doyle, in Dental Review.*

IMMEDIATE REMOVAL OF PULPS.

In removing exposed pulps I seldom use arsenic, especially in single-rooted teeth. After adjusting the rubber dam, I put from one-fourth to one half grain muriate cocaine on the top of my slab and add to this four or five drops of water; I usually use a ten per cent. solution. After drying the tooth the best I can, I saturate a small pellet of cotton in this solution, apply it to the cavity and leave it in about a minute; then with a sharp stiff broach, puncture the pulp; make it bleed, then wipe out and apply again. In a minute or two I can push the pulp out of the way with a small piece of cotton wrapped on a broach, then with a large bur I enlarge the opening; keep the pulp out of the way, letting it bleed occasionally, or where there is pain. After you have all the room you want, draw the pulp back; if there is pain, apply more cocaine and puncture with sharp smooth broach. Then with a sharp barbed broach (or what I like best is an ivory screw-broach), enter the pulp and pass it half-way or more up the canal, and you can extract with barely a twinge of pain, let it bleed freely, wipe out with alcohol, then carbolic acid till it is clean and does not discolor cotton passed in on a small broach. Dry with hot-air syringe and fill. I use gutta-percha wound tightly around a wood point, and never chlora-percha, unless it is a flat or tortuous root with small apical foramen.

I would like to say a few words about roots and teeth, on which it is very difficult, and sometimes impossible, to adjust the rubber dam.

There are hundreds of such teeth we must save. It is not absolutely necessary for the canal to be dry for a successful root-filling, but it must be aseptic. After opening up a canal for treatment it should never be left without stopping it with cotton, not even when the dam is on. If this precaution is taken, and with the use of a saliva ejector, there need be no fears about filling any root you can make aseptic.—*Dr. B. Q. Stevens, Hannibal, Mo., in Archives.*

THE number of students graduated from the various Dental Colleges in the United States for 1891, are as follows .

Ohio College of Dental Surgery,	75
Pennsylvania College of Dental Surgery,	94
Philadelphia Dental College,	145
Dental Department, Southern Medical College,	38
Dental Department, University of Maryland,	64
New York College of Dentistry,	86
Missouri Dental College,	26
Indiana Dental College,	40
Dental Department, University of Iowa,	58
Mehany Dental Department, Central Tennessee College,	1
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THE PRACTICAL PLACE.

Tincture of Iodine mixed with glycerin, is claimed by Dr. Hammond to prove more effective as a local application than the plain tincture. This is due to the retardation of the dissipation of the iodine or, more likely, to the skin remaining soft, and hence in a better condition for absorbing the drug.

Keep your corundum wheels wet with water containing a few drops of alcohol. If they have become gummed, soak in a solution of caustic potash, afterwards washing in weak alcohol. The treatment is old, but none the worse on that account.

"Rheumatism," said a popular physician of New York city, "is caused by acidity of the blood, and should never be neglected. A remedy," he says, "that will prove an incalculable boon to people suffering from this ailment is the oil of gaultheria (oil of wintergreen). Get twenty-five cents' worth and put ten drops on a lump of sugar, place it in the mouth, allow it slowly to dissolve and swallow it. In the meantime take a dose or two of Rochelle salts. That," said the physician, "is all there is to it; and if taken as I have prescribed, it will save suffering humanity many dollars in doctors' bills, to say nothing of pains, aches and swellings."

Platinized Silver for Dental Plates.

Silver four and platina one part, makes a very good alloy for dental plates, it works easier in swaging and can be soldered with eighteen karat gold solder.

This alloy is used quite extensively in England, we are told. Dr. Haskell recommends its use by dental students, and certainly it is much preferable to brass or copper for them; its cost is only about one-fourth that of twenty karat gold plate; rubber can be used on it for attachment, the same as on gold plate.

The alloy does not tarnish in the mouth, which fact is readily recognized when we know that the sulphuretted hydrogen set free in the process of vulcanizing does not effect the plate sufficiently to preclude its use in this way. It is as rigid as eighteen karat gold plate, and is especially adapted for partial plates. We hope to see it adopted more extensively in the colleges and in practice; certainly it is worth an impartial trial.—*Archives*.

The Conservation Treatment of the Dental Pulp.

In a paper read before the American Dental Society of Europe, Dr. A. C. Hugenschmidt, of Paris, summarizes his treatment as follows : First, wash out cavity with a 1.2000 sol. of bichloride of mercury. The capping is powd. iodoform of salol mixed with lanolin and covered with mica, the rest of the cavity being filled with oxyphosphate or oxy-chloride of zinc. In cases where pulp is fully exposed and unprotected by decalcified dentine it should not be capped at once.

In summing up he says : First, in healthy, freshly exposed pulps salvation is not only possible but probable ; second, pulps long exposed, but not suppurating, can be saved in a large majority of cases ; third, in suppurating cases the pulp can only be saved after proper antiseptic care, and not in all cases ; fourth, tumors of the pulp require extirpation and the removal of the entire pulp.

Why Carbolic Acid Should be Discarded by Dentists.

1. Because of its deleterious action on the pulp ; oil of cloves is preferable to carbolic acid.
2. As a root canal dressing it is, because of its great solubility in water, not to be depended upon.
3. It is not a chemical disinfectant when brought in contact with sulphuretted hydrogen.
4. When it comes in contact with dentine it is absolutely useless.
5. Its beneficial action is only temporary.
6. Unless combined with oils it is valueless.
7. As an agent for injection it is without value if there are fine roots that hold fragments of pulp.
8. It does not possess embalming properties.

Dr. A. W. Harlan.

Death from Cocaine Injection.

The *Journal fur Zahnheilkunde* reports a case of death in a dentist's chair from injection of cocaine into the gum, given for the purpose of inducing anæsthesia for the extraction of roots of teeth. The patient was a woman, twenty-nine years old, apparently perfectly healthy but very nervous. The extraction was painless, and nothing abnormal was noted. The operator withdrew from the patient's chair to get some water for the patient to rinse her mouth with, and on his return found her motionless. Physicians were summoned

and artificial respiration was practiced, but without success. The autopsy disclosed the fact that three injections had been given, which served for the extraction of three roots. The quantity of cocaine in each injection was two centigrams, or one-third of a grain. The *Journal*, after commenting upon the dangers of cocaine, refers to nine cases of fatal poisoning reported by Dufournier in the *Archives generales de Medicine*. One of these cases, however, is doubtful, as the patient took a mixture of chloral and cocaine. The *Medical and Surgical Reporter,* in quoting the above, says that the uncertainty of the action of cocaine is shown in a case reported in the *British Medical Journal*, where one seventh of a grain injected into the eyelid produced very serious poisoning.

Cement for Glass Labels.

"New subscriber," Warren, Me.—Beeswax is an excellent material for attaching glass labels either to bottles or to wood surfaces. Melt the wax, warm the label, and also the surface to which it is to be applied when practicable, coat the label with the wax, place on the surface and press the label gently into place. As the wax begins to cool, renew the pressure with sufficient force to expel any great excess of wax. When quite cold this excess is to be scraped off and the surface can then be made perfectly clean by rubbing with a rag moistened with turpentine.

White wax may be used instead of yellow ; while scarcely as tenacious it is quite enough so to answer, and presents a better appearance when the back of the label happens to be seen.

A small proportion of rosin is sometimes added, but the cement is better without it, unless it is to be exposed to a tropical temperature.

How to Cure Felons.

I notice in a recent issue a cure for felons. I will give you one that I discovered accidentally when a young man. I was engaged in marking iron with white lead and turpentine, and, having a felon coming on my finger, dipped it frequently into the mixture. As the iron was quite warm which I was marking at the time, I found the next morning that there was a small yellow spot where I felt the felon. I opened this, and had no more trouble from it. The next time I felt one coming I procured some turpentine and bathed the part affected frequently, and held it near a warm surface to dry, with the same result as the first. Since then I have used it several

times, always with the same result. I also have had others try it, among them some of our men who work in the rolling mill, whose hands are covered with a very hard skin, and every one of them who tried it met with the same result, saving them a great deal of time, money and pain. I asked an eminent physician why the turpentine should produce such a result. His answer was, "It is a counter-irritant."—*James Mallen in Scientific American.*

Hot Water in a Hurry.

Very often a physician needs hot water in the middle of the night when there are no conveniences at the house of his patient to obtain it. The *Dixie Doctor* suggests that if there should be a kerosene lamp handy with a chimney having a corrugated top, this want can be easily met. Place an ordinary tin cup with a sufficient amount of water upon the top of the chimney. The corrugatious let out the heated air so that the lamp will not smoke and the water will quickly become hot.

Removing Foreign Substances from the Nasal Cavity.

Dr. T. J. Slaton (*Med. Record*) describes a method as follows: "The operator places a thin cloth over the child's mouth, applies his finger to the nostril not containing the substance, pressing sufficiently to close the lumen, and then puts his mouth to the child's and gives two or three strong puffs. The substance will fly out nine times out of ten. I have blown them ten feet out, often. I have used this method for the last ten years with but one failure; in that case I failed, but forced the substance so near the anterior nasal openings that I had no trouble in removing it with forceps."

The Benefit of Coffee.

Dr. I. N. Love, of St. Louis, in a paper on this subject, said that his experience for five or six years first had been strongly in favor of taking a cup of strong, black coffee, without cream or sugar, between two glasses of hot water, before rising every morning—at least an hour before breakfast. The various secretions were stimulated, the nervous force was aroused, an hour later a hearty meal was enjoyed, and the day's labor was begun favorably, no matter how the duties of the day and night preceding might have drawn upon the system. Another cup at four in the afternoon was sufficient to sustain the energies for many hours. In this way the full effect was secured.

If along with this the proper diet was taken at the proper times—and the ideal diet for those who make large draughts upon their nervous systems and expected to have them honored was hot milk—and at least eight hours of sleep were taken out of every twenty-four, one's capacity for work would be almost unlimited.

Sozodont.

T. S., Philadelphia.—A similar preparation may be made, it is said, by the following formula:

Castile soap, (white)	$\frac{1}{2}$ oz.
Oil of peppermint	5 drops.
Oil of wintergreen	12 drops.
Glycerin	$\frac{1}{2}$ oz.
Water	1 oz.
Alcohol	2 oz.

Cochineal mixture, sufficient to color.

Quillaia is sometimes used in similar mixtures instead of soap; but the soap is preferable, as quillaia is a very irritating substance, and its active principle, saponin, is credited with being a decided poison.

Sensitive Dentine.

Dr. Samuel A Milton, of Clinton, Mo., in the *Dental Cosmos*, claims gratifying success in obtunding the sensitiveness of dentine by placing a little *oil of cloves* in the valve of the hot air syringe, and vaporizing the oil with heat, and blowing the medicated vapor into the sensitive cavity. If the vapor be oily, as is likely, he removes this with absolute alcohol.

Removal of Breast During Hypnotic Sleep.

Dr. Schmeltz, of Nice, has recently recorded a case in which he removed a sarcomatous breast during anæsthesia caused by hypnotism. The patient was a girl, aged twenty, who was easily thrown into the hypnotic state. The operation was performed in the presence of Drs. Lauza and Barriera, and the entire organ, together with the aponeurosis of the pectoralis major, was removed by the oval incision. Five drainage tubes were inserted and the wound was closed with thirty-two metallic sutures. The operation lasted an hour, the patient remained absolutely insensible, in a condition of the deepest anæsthesia, such as is only seen after large doses of chloroform. Dr. Schmeltz says: "I operated very slowly and quite at

my ease; the patient even tried to encourage me by her words; she seemed very gay, and laughed loudly from time to time as if to show that she felt no pain. In order to make the operation easier for me, she turned herself about so as to place herself in the most favorable position, keeping her right arm stretched out so that no assistant was required to keep it steady." She was kept under observation for the rest of the day, and having been told not to feel pain and to have a good night, she obeyed these instructions in the most docile manner. The wound was completely healed on the fifteenth day. The only symptom worth mentioning, which Dr. Schmeltz observed in the patient during the operation, was great pallor of countenance, without any dilation of the pupil or weakening of the pulse. The tumor weighed two kilogrammes.—*British Medical Journal.*

Plaster Casts.

Have the following articles on your bench ready for use:

1st. *Soap Varnish*, made by dissolving English white Castile soap in soft water to the consistency of milk.

2d. *Dredge Cup*.—Take a half-pound baking powder can, and have your tinner make a cover for it, having the entire top part made of strainer wire, such as is used on milk pails. Keep this cup always filled with fine, strong plaster.

3d. *Bottle of Mixing Solution*.—Consisting of soft water and two per cent. of alum, or borax, or sulphate of potash.

4th. *Pepper Box*, filled with fine, powdered soapstone, and a jeweler's extra soft bench brush.

We will suppose you have a perfect impression for full mouth. Coat the impression with soap varnish, brushing it in thoroughly till a good lather forms; now rinse off with cold water and it is ready to pour. Next pour in your bowl the right quantity of mixing solution, then add the plaster, shaking it in carefully from the dredge cup till it comes a little above the surface of the solution; stir a little. If not thick enough, shake in more plaster, for to have a good, smooth, hard model it should be worked as thick as possible, and it can be worked very thick, as the solution used causes it to set slowly. Now fill the impression slowly, tapping the bottom of the cup to make the plaster settle and drive all air to the surface. When the model is hard enough, separate it from the impression and let it stand to dry. Shake the soapstone over it thickly and polish with the jeweler's brush till perfectly smooth. A model made thus, and

then before packing covered with the tin-foil, or liquid tin, gives a plate as smooth as when vulcanized on solid metal cast.—*Dr. Wm. Steele, in Items.*

Precious Metals Mined in 1890.

The annual report of Wells, Fargo & Co., of precious metals produced during 1890 in the States and Territories west of the Missouri River, including British Columbia, shows: Gold, $32,156,916; silver, $62,930,831; copper, $20,569,092; lead, $11,509,571. California produced in gold, $9,896,851, silver, $186,263; Nevada, gold, $2,693,884, silver, $6,546,652; Oregon, gold, $965,000, silver, $71,000; Washington, gold, $194,000, silver, $85,000; Idaho, gold, $3,595,333, silver, $10,229,167; Montana, gold, $2,764,116, silver, $12,050,339; Colorado, gold, $4,210,961, silver, $13,064,486; Utah, gold, $88,798, silver, $12,170,377; New Mexico, gold, $376,034, silver, $1,282,951; Arizona, gold, $1,150,486, silver, $6,446,863; Dakota, gold, $3,045,560; Texas, silver, $249,423; British Columbia, gold, $361,555; Mexico, gold, $12,689,000, silver, $415,645,000.

Duration of Life.

The inferior animals, which live, in general, regular and temperate lives, have generally their prescribed term of years. The horse lives twenty-five years, the ox fifteen or twenty, the lion about twenty, the dog ten or twelve, the rabbit eight, the guinea-pig six or seven years. These numbers all bear a similar proportion to the time the animal takes to grow its full size. But man, of all the animals, is the one that seldom comes up to his average. He ought to live one hundred years, according to his physiological law, for five times twenty are one hundred; but instead of that he scarcely reaches, on the average, four times his growing period; the cat six times, and the rabbit even eight times the standard of measurement. The reason is obvious—man is not only the most irregular and the most intemperate, but the most laborious and hard worked of all the animals.—*Exchange.*

Cleanly and Orderly Workshops.

There is no doubt about it, cleanliness about a shop is one of the rules which should be most rigidly enforced. There is no excuse for permitting piles of rubbish, scraps, etc., to lie around on the floor and benches, neither should the machinery be allowed to remain covered with grease and dirt. Clean machinery tends toward the keeping of everything in the best order. Dirt and grease often hide indi-

cations which if observed in time might prevent a breakdown, and an attendant loss of property, and possibly a loss of life or an injury to the workmen. Workmen should take pride in keeping their benches and surroundings as free from litter as possible. It is an unpleasant sight to go into a shop and observe a workman who desires some particular small tool rummaging over the numerous scraps, tools, etc., which cover the machine or bench at which he is working in order to find the tool he desires to use. Each workman should have a particular place for each tool, and return it to its proper place as soon as he is done with it. It is a very simple matter, adds the *Railway Master Mechanic*, to clean up a bench at least once a day, but when it is neglected from day to day, it soon presents an untidy and unsightly appearance.

Normal Weight of Man.

A rule to determine the normal weight of a man is as follows: A man should weigh just as many kilogrammes as he measures centimeters in height, after deducting one meter. A man who measures in height 1 meter 80 centimeters (5 ft. 11 in.) should weigh 80 kilogrammes, or about 160 pounds. The rule is both ingenious and approximately correct.

Acidity of the Stomach.

This condition is due to germs, and the cure lies in getting rid of the germs. Germs of fermentation in the stomach produce first alcohol, then carbonic acid, and then acetic acid. A person troubled with this form of dyspepsia should be careful to take only such articles of food as do not favor the development of germs, and thus starve them out. Another thing to do is to wash the germs out of the stomach while drinking freely of hot water before meals. If food is put into a stomach already sour, of course fermentation will be set up immediately. Some persons notice that as soon as they eat their stomachs become sour. The third important thing to do is to stimulate the stomach to make more gastric juice, which is a natural antiseptic, and prevents fermentation and also hastens absorption. The glands may be stimulated by applying hot fermentations to the stomach for half an hour immediately after the close of a meal, or, easier still, by wearing a rubber bag filled with hot water directly over the stomach for half an hour or an hour. Heat is a natural stimulant, and there are no possible ill-effects from its use in this way.—*Good Health.*

HAD NINETEEN TEETH DRAWN.

A Woman Driven Crazy by the Operations of a Dentist.

Mrs. Ella Targett, of 784 Amsterdam avenue, a woman of large frame, is in the insane pavilion at Bellevue. Her outbreaks give her keepers the greatest trouble, and she is almost constantly in a strait-jacket. She is the wife of George Targett, an agent for several apartment houses, and was taken by him to the hospital on July 16.

When he brought her there he said that he believed his wife's insanity had been brought on by a sitting at the dentist's at which she had had nineteen teeth drawn under laughing gas. Mr. Targett said yesterday:

"For the past six months my wife has been weak and nervous. She had been in the country for a time, and upon her return complained that she had suffered dreadfully from neuralgia of the face. She thought that she would be better if she had her teeth pulled and begged me to give her money for this purpose. I did so, and she started out with her aunt a week ago last Thursday. She left the house early in the afternoon, but did not return until about 9 o'clock at night. She seemed utterly broken down when she reached the house and was in a fever. For an hour I could not get a word from her as to the experience she had undergone. The aunt told me, however, that my wife lost two quarts of blood, and finally my wife herself said that, although she had taken gas, she could feel each tooth as it was pulled. The aunt declared that she had first asked the dentist if it would be perfectly safe to administer the anæsthetic, and he answered her that it would. A physician who had attended my wife before, was called in. He said she ought not to have taken gas. She grew steadily worse, and the insanity under which she now suffers has rapidly developed. She has never been out of her mind before. We have been married eleven years."

Dr. Stuart Douglas, under whose care Mrs. Targett is at Bellevue, said yesterday that her condition is extremely serious. "She screeches in horror at the blood and bloody visions pictured by her disordered mind," he said, "and writhes and twists with furious strength in the hands of those who seek to restrain her. The suicidal mania is strongly developed."

When asked if the shock from tooth pulling might precipitate insanity in a person with some leaning that way, Dr. Douglas said it was possible. He would hazard no opinion in Mrs. Targett's case, however, but said that he knew of nothing for which the dentist was reprehensible.—*N. Y. Correspondence Philadelphia Times, July 19.*

A CHECK ON SNEEZING AND COUGHING.

Dr. Brown-Sequard, in one of his lectures, with reference to a check on sneezing, coughing, etc., says:

"Coughing can be stopped by pressing on the nerves of the lips in the neighborhood of the nose. Sneezing may be be stopped by the same mechanism. Pressing in the neighborhood of the ear, right in front of the ear may stop coughing. It is so also of hiccoughing, but much less so than for sneezing or coughing. Pressing very hard on the top of the mouth is also a means of stopping coughing, and many say the will has immense power. There are many other affections associated with breathing which can be stopped by the same mechanism that stops the heart's action. In spasm of the glottis, which is a terrible thing in children, and also in whooping cough, it is possible to afford relief by throwing cold water on the feet, or by tickling the soles of the feet which produces laughter, and at the same time goes to the matter that is producing the spasm, and arrests it almost at once. I would not say that we can always prevent coughing by our will; but in many instances these things are possible, and if you remember that in bronchitis and pneumonia, or any acute affection of the lungs, hacking or coughing greatly increases the trouble at times, you can easily see how important it is for the patient to try to avoid coughing as best he can."

MAKING APPOINTMENTS.

Dr. Harlan says one of the best means of securing control over patients, when once confided to your care, is to make appointments by mail. If it happens to be a child, the notice is sent to the parent, and it is understood that unless some reason is given, they will be present. He has appointments running from three to six months and a year. The responsibility of patients is ended when they leave the office. But he sees they give consecutive attention to their teeth. He finds they not only appreciate this, but that it is a good business and prophylactic measure.

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NINTH PAPER.

OPERATIVE DENTISTRY.

By THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

(Continued from page 134, Vol. 5, No. 5.)

CAPPING NERVES.

This operation is attended with varying success. Some claiming fair success, others almost unvarying failure. In certain cases, and under certain indications it may result favorably, but in the large majority of cases it seems to be inexpedient. The plan suggested by Dr. King, of Pittsburg, appears to have resulted with better success than any other proposed. The rubber dam is applied and the cavity dried, after which it is flooded with creosote. Some of the oxide of zinc (or powder) is mixed to a thick paste with creosote, on a glass slab. The creosote which was placed in the cavity is dried out, with spunk or bibulous paper, when the paste is placed in position over the exposed nerve. Some of the oxychloride of zinc is then mixed thin, and flowed over this paste, and when this hardens, some of the same mixed stiffer is used to fill the remainder of the cavity. Some operators prefer to use the oxyphosphate of zinc in the same way in preference to the oxychloride, because of the pain given by the latter.

TREATING ROOTS.

The treating of roots for the cure of alveolar abscess, or putrescent pulp, must be attended with varying success If it could be ascertained *with certainty* that the pus sack always occupied a position *on the end of the root*, then the treatment would likely be more certain; but, as all dentists are aware, this is not always the case, for we find it sometimes on the side of the roots and sometimes at the bifurcation, yet oftener on the end of the roots, as Fig. 152 shows; and as this can never be known to a certainly, the treatment must be of necessity attended with doubt or misgivings. Even when the

sack *is* at the end of the root, a cure is not always affected, for sometimes (even in this most favorable position) the sack is so tough and adherent that it requires considerable medication, if not surgical effort, to break it up. This we have satisfied ourselves, in making the effort to detach an abscess from the end of a root after extraction ; judge then the difficulty when the sack is not as accessible. It has been recommended to drill through the alveolar plate and bur away the abscess from the end of the root, but judging of the difficulty of making such a detachment when the whole tooth is in the fingers, as it is after extraction, we must take these recommendations as to what is to be done *cum grano salis.* Indeed, we do not think that it is absolutely necessary to get rid of the sack; for what is the sack but an extension of the peridental membrane, which has been forced away from the end of the root, or from the sides of the root, or from the bifurcation of the roots, by the accumulation of pus in its effort to find a vent? Therefore, if such be the case, if we can by a proper approach to these parts use such medication as will destroy the septic matter within the sack, we will have done all that we can ; and Nature, who is so anxious for ease and perfection, will second Art to effect the cure.

FIG. 152.

In the treatment of roots, therefore, a direct approach to the diseased parts is the first necessity. Whether there is an external fistula or not, the broach should pass freely through the foramen at the end of the root so that the medicines used in the treatment may attack or act upon the diseased parts. Of course, where the root terminates with a crook and this direct approach is thereby thwarted, it is reasonable to suppose that our efforts at cure will be thwarted also. Then again, even when all things are done thoroughly, there are certain conditions of the body that will thwart our efforts, so to say that alveolar abscess and the treatment of putrescent pulp is *always* amenable to cure, is to say that all diseases are alike amenable to cure. Do your work thoroughly and this is all you are called upon by your conscience to do.

The approach to the diseased root or roots being made as direct and as accessible as possible, all septic matter should be removed. We believe that the root or roots should be reamed out and enlarged, so that the medicines used in the treatment may be applied with more certainty and precision ; but in doing this the utmost care must be observed that the smallest debris from the reamer be not pushed forward in advance of the reamer and stop up the minute apical foramen. This may be necessary up to the point of constriction, which terminates the root canal and begins the foramina at the root end. This part must be made perfectly free with very fine nerve broaches. If this part is made free, medicines may be forced through the foramina to attack and cure the disease beyond. Indeed, we believe that if used freely, the tube is sufficiently small to draw the medicine through by capillary attraction, when this canal has not become enlarged, as it is sometimes, and in the cases of young teeth.

A number of new remedies have of late years been advanced and recommended for the treatment of this disease, but in our experience none of these have yielded better results than carbolic acid or creosote.

The root canal being well opened, either of these medicines is used on a probe, mopped with cotton, and pumped in. This pumping forces the medicine through the root and attacks the diseased part beyond. Should there be an external fistula, the medicine will be seen to emit on the gum, producing a froth accompanied by the white eschar of these cauterizing medicines. Sometimes the tract of the abscess gets choked, in which case it is well to free it with a probe on which cotton is wrapped. This probe should be carefully introduced, otherwise it gives considerable pain. The tract of the abscess being freed, the pumping may be continued until the medicine passes through freely. A small pellet of cotton steeped with either of these medicines may then be passed up the root canal as far as it will go. The lower part of the canal may be loosely sealed with cotton and the case dismissed. On the return of the case the treatment may be repeated if found necessary. It *will* be necessary to renew the treatment, when, on withdrawing the cotton which was placed near the apical foramen, it is found this bears the odor of putrefaction. A second treatment will generally render the root inoxious. After the second dressing it is advisable to pack *pure white cotton floss tightly* in the root canal *near the foramen* and to seal tightly the remainder of the root. On the next presentation, should the cotton be free from stain and odor, the root may then be filled.

Should the foramen be so increased in size, from the effects of the disease, or from the age of the tooth (this part of the root not having completely ossified) as to permit rather a large probe to pass freely through it, it is advised to proceed as follows: A small nerve broach, *without temper*, is bent at its end at right angles, as shown by Fig. 153. The hooked end is gently passed through the foramen and then lightly drawn back until the hook catches. It is held thus until the shank is marked to indicate the length of the root, as shown on the shaft of the instrument. The broach is then withdrawn, after which an orange-wood twig is sharpened to a long slender point, like Fig. 154. This is marked on the slender part to the same length as the mark on the hooked probe. It is then passed into the root and tried until it fits tightly at the apex, while the mark on it indicates, at the same time, that it has not passed through. If it is found too loose, it must be removed and some of the end cut off so as to make it fit tightly and still be the exact length. When this is all accomplished it is nicked all around with a sharp knife,

FIG. 153.

FIG. 154.

about 3-16ths of an inch from the end, as indicated by Fig. 154. This end may be dipped in carbolic acid, when it is carried to the root and forced to its place by a slight tap of a small mallet. This will generally break it off at the point which was nicked near the end. If it does not, this can be accomplished by a twist. This seals the foramen without permitting the stick protruding beyond the end of the root. The remainder of the root canal may be filled with whatever filling material seems best to the operator.

We do not think it best to fill the crown of such teeth with gold right away, but prefer to fill them with gutta percha. Our reason for this is that as the peridental membrane is in an irritated condition from the treatment, and needs rest to recuperate, and this rest would not be given to it by the insertion of a large contour gold filling, especially if the filling were inserted by the aid of the electric, pneumatic, automatic or mechanical mallet.

It will be found, sometimes, on opening into root canals, that as soon as the opening is fairly made, a drop of pus will exude. This flow will generally increase in volume until the whole cavity becomes

filled with pus. This exudation of pus is ordinarily followed by pain, but the pain soon ceases. Such cases may be regarded as more favorable, as it is an indication that the peridental membrane has not yet become involved, and the filling of such root canals are generally less tedious and more successful.

APPROACHING ROOT CANALS.

The approach to root canals in the central and lateral incisors and cuspids in the upper jaw is best effected from their palatal surfaces. A good approach cannot be obtained either from the mesial or distal decayed surfaces of these teeth. If the decay has not made such havoc on these surfaces as to involve a large part of the palatal surfaces of these teeth, it is better to fill these proximate surfaces, and make a small opening on the palatal surface by which a direct approach is had to the root canals, as shown by Fig. 155. This procedure *weakens* the tooth *less* than if the proximate cavity were cut away to the central part of the palatal surface, in order to obtain the direct approach.

To start this approach to the root canal in these teeth the head of the patient is thrown well back on the head rest, and with a small corundum point, kept wet with a pipet, the enamel is ground away until the dentine is reached. The corundum point is now shifted from the hand piece of the dental engine, and a spear point drill, like Fig. 156, is inserted in its stead. This will soon reach the root canal. If the orifice be too small for proper manipulation, it may be gradually increased in size by the use of flexible burs, like Fig. 157. When this orifice is made, the debris may be removed with Palmer's nerve instruments, Nos. 9, 10, 11, as is shown by Fig. 158, and very delicate spring tempered nerve instruments, like Fig. 159, will be found very available to cleanse out the dead pulp in the root canal farther up within the canal.

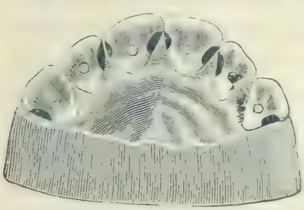


FIG. 155.

The septic matter from the dead pulp permiates the dentine, to a certain depth, so that it has been our practice to ream out the nerve canal, both for the purpose of better manipulation, as well as to get rid of the greater part of this putrescent dentine. The profession is, however, divided in its opinion as to the advisability or inadvisability of this operation. Nerve canal reamers, such as are shown by Fig. 160, are used for this purpose, although those known as the "Morey nerve canal reamers" have served our purpose better. Dr.

Morey considers it perfectly safe to use these reamers in the dental

FIG. 156.

FIG. 157.


FIG. 158.


FIG. 159.

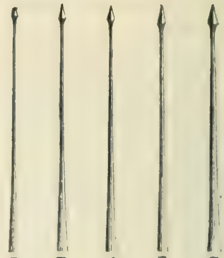


FIG. 160.

engine, but we prefer to have them made into hand instruments for fear of breaking the tool off in the root canal. In their use we have used the *largest* reamer *first* (of course the size of the root worked on must be taken into consideration) and each successive smaller sized reamer used after. The debris will generally be thrown back from the cutting head of the tool, but, before another reamer is used, any small particles of debris that may cling to the sides of the canal should be removed with delicate probes. This procedure is carried on until the apical foramen is reached. The probe is then tried until it passes through the foramen and is felt by the patient. This being done the root is treated with such antiseptic medicines as have already been advised.

To approach the roots of the upper bicuspids the mesio-masticating surface offers the best presentation, and these teeth are frequently found decayed on these surfaces. The disto-masticating surfaces of these teeth do not offer so favorable a presentation as the former, and ordinarily more tooth substance has to be cut away when the roots have to be treated from this surface.

When these teeth are excessively decayed from either the mesio masticating or disto masticating surface, as shown in Fig. 161, the first procedure will be to grind away all the weak enamel edges with small corundum points in the dental engine. After this the rubber dam may be applied and the decay within the cavity removed with large spoon excavators, like Fig. 162, or with large round or oval cavity burs in the dental engine. It is useless to use burs in the *wet dentine*, as the leaves of the burs get filled with bone tissue, and however sharp they may be, they will clog and not cut when the

tooth is wet. Cut no more of the dentine away, especially that which is next the buccal and palatal margins of the tooth, than possible.

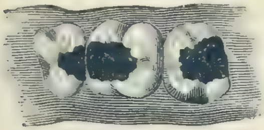


Fig. 161.

The decayed dentine being removed, search is made for the root canals with the probe; when located they should be cleansed in the same manner as advised for the incisors and cuspids.

The approach to the roots of upper molars is conducted in the same way as has been indicated for the bicuspids, and the whole procedure is the same.

To approach the roots of the lower incisors—although this is rarely necessary, as these teeth seldom decay so extensively as to require root treatment—an opening may be commenced at their cutting edges or through the bulbous portion of the crown, similar to what has been advised for the upper incisors and cuspids.

The approach to the roots of the lower cuspids is made from the lingual aspect, such as has been advised for the upper cuspids.

When decay attacks the lower bicuspids on their mesial surfaces to such an extent as to require root filling, the approach to the roots of these teeth is comparatively easy and the procedure for the preparation of the crown cavity and the root is conducted in a manner similar to what has been described for these teeth in the upper jaw. But when the decay attacks the tooth and destroys the pulp by exposure from the distal surface, considerable more labor and trouble is entailed. These teeth, especially the first bicuspids, are not very large, and to approach the nerve canal, from the distal surface, requires careful cutting so as to obtain direct approach without cutting away too much tooth substance. It will be found that the nerve canal is on a line with the buccal point or cusp of these teeth, more especially with the first bicuspids. When the crown cavity is prepared by means of small corundum points in

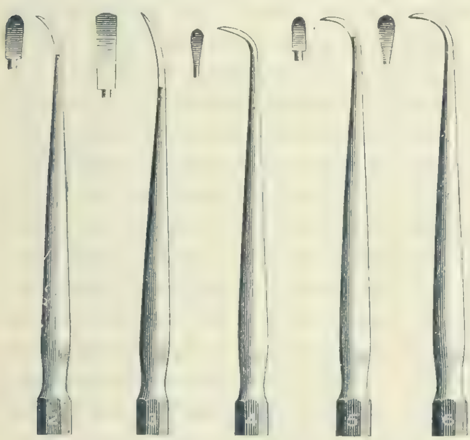


Fig. 162.

the dental engine, the rubber dam is applied and as much of the decayed dentine removed as may be, without weakening the tooth too much, in the manner before advised. The engine handpiece is now armed with a fissure bur and this used, allowing *one-half of the cutting part of the tool to be in the cavity* of decay, and cutting away from the masticating surface towards the point or buccal cusp of the tooth, as shown in the second bicuspid of Fig. 163, so as to approach the root canals as directly as possible, with as little sacrifice of tooth substance as may be.* By an examination of this cut it will be seen with how much greater facility the root canals are reached, when the opening is from the mesio-masticating surface, as shown in the molar teeth.

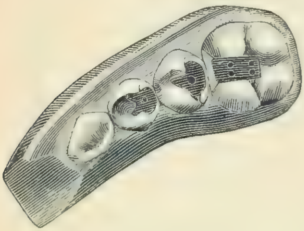


FIG. 163.

Finally, the approach to the root canals of the lower molars *must be made from the mesio-masticating surface.* We would much prefer to fill a cavity in the distal surface of these teeth, even though it had encroached to the masticating surface, than to attempt root filling in these teeth by cutting away the entire masticating surface from the distal cavity for the purpose of reaching the anterior root canal. The canals of these roots are so close to their mesial edges that with the overhanging of the crown at its masticating surface, so much of this has to be cut away in order to obtain a direct approach to this root, as Fig. 164 shows, that the tooth is very much weakened. Fig. 163 shows with how much greater facility this root, as well as the posterior root is reached from its mesio masticating presentation. Of course, if the decay is entirely from the disto-masticating surface, with no decay on the mesio masticating surface, then there is no help for it and the tooth must be cut away as shown in Fig. 164.

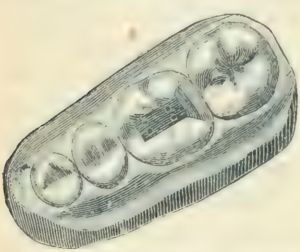


FIG. 164.

[TO BE CONTINUED.]

EIGHTH PAPER.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

BY THEODORE F. CHUPEIN, D D. S., PHILA., PA.

Q. Should the tooth lose all its vitality and a circulation is not kept up through its alveo-dental penisteum, what ensues?

*The cut does not show our meaning as clearly as we had prepared our models for the engraver.

A. In such a case the tooth becomes a foreign body, an inflammation of the socket ensues, the gums become turgid, soft and flabby and the tooth loosens, is sometimes expelled, or if not gets so loose that it is removed without force or pain.

Q. Is this the case with all the teeth?

A. It may be, but these sequences are more noticed in the incisors and cuspids than in the back teeth.

Q. Is there any particular reason for necrosis?

A. Necrosis may ensue from various causes. Long spells of sickness and fevers, also the continued use of mercurial medicines, from caries or from blows; but the principal causes are inflammation of the lining membrane, defective nutrition, or a lack of vital force.

Q. What is the treatment for necrosis of the teeth?

A. When this is suspected, by the condition of the parts, one of the first effects is the extraction of the tooth, which points it out to be the cause of the trouble, however prominent or useful the tooth may be. All efforts should be made, however, first, before resorting to extraction, by leeching the gums, and the use of astringent mouth washes. If this treatment is promptly made it may thwart the most serious sequences.

Q. If such efforts are successful what should next be done?

A. The nerve canal should be entered and perfectly cleansed, after which the root should be medicated and rendered perfectly healthy, when it may be filled, root and crown.

Q. What is the object of *bleaching teeth?*

A. To improve the color.

Q. How does a tooth become discolored?

A. When a tooth becomes necrosed, a discoloring matter from the dead pulp or from the blood infiltrates into the dentinal tubuli, and renders the tooth a dark, opaque or lifeless color. The object of bleaching the tooth, as it is termed, is to restore the color.

Q. How is this accomplished?

A. The decayed matter is first removed from the crown of the tooth and an entrance made into the root canal. Both of these are perfectly cleansed. And bleaching agents, such as the chloride of soda or chloride of lime, are packed into the root canal and crown cavities, and securely sealed and allowed to remain in place from fifteen to thirty minutes.

Q. Is this all that is necessary?

A. No. Several applications may be necessary before the object is attained.

Q. Are there any precautions to be used in the employment of these agents?

A. Yes. The tooth should be isolated from the gums (preferably by the rubber dam) by napkins so as to prevent either the chloride of lime or soda from falling on the face or gums.

Q. What agent yields the best results for this operation?

A. A solution of the chloride of soda known as "Labarraque's Disinfecting Fluid."

Q. Are any other means used to this end?

A. Yes; very good results have been attained by packing the tooth full of a paste made with dry chloride of lime combined with dilute tartaric acid, sealing this into the tooth quickly and depending on the effervescence neutralizing the discoloring matter in the tubes of the dentine. Oxalic acid, cyanide of potassium are also used, but should be used with great care on account of their deadly poisonous qualities. The filling material, known as the oxy-chloride of zinc has also yielded good results for this purpose.

Q. Can you give Dr. Harlan's method of bleaching teeth?

A. "After the root has been filled and the tooth is free from tenderness, apply the dam, dry the cavity, and remove all discolored dentine. Wash the cavity several times with fresh peroxide of hydrogen and place a few crystals of chloride of alumina in the cavity, moistened with the peroxide of hydrogen, and wait from three to five minutes; wash the cavity thoroughly with distilled water, then apply a solution of thirty grains of borax to the ounce of water until the acid is entirely neutralized. Dry the cavity with hot air, and paint the interior with copal-ether varnish. When it is dry mix oxychloride of zinc of the desired color and fill the cavity full; allow it to harden, then prepare the cavity for the gold filling and fill it at once."

Q What other plan has been suggested?

A. To clean the cavity thoroughly and to glue white paper next the thin enamel with any clear white etherial varnish. Over this insert an oxychloride of zinc filling and when this hardens prepare and fill with gold.

Q. What is Dr. Ames' plan for bleaching?

A. He applies electrolysis for the purpose by placing nacent oxygen in contact with the discolored surfaces. Fill the root and moisten the cavity with acidulated water (one drop to the ounce of water, in order to render it a more effectual electrolyte), then apply a metal electrode connected with the negative pole of the battery in

contact with the moistened surface of margin of cavity and pass a platinum needle, connected with the positive pole of the battery over the surface to be bleached. Upon closing the circuit the oxygen of the water is liberated at the positive pole near the surface to be bleached, and the hydrogen is liberated at the negative electrode outside the cavity.

Q. What caution is to be observed?

A. The effect of these agents, especially the chlorides of soda and lime, is to remove the organic constituents of the tooth, and the results of their too frequent application may make the tooth weak or brittle.

Q. What do you understand by hypercementosis?

A. Hypercementoses or exostosis is a deposit of bony substance around the roots of the teeth.

Q. Is it a disease peculiar to the teeth alone?

A. No, it is a disease that attends all bones.

Q. What part of the tooth is attacked by this disease?

A. Only the roots.

Q. Is it observed on young teeth?

A. No, only on fully formed teeth.

Q. Where does it locate?

A. Generally on the sides or on the ends of the roots.

Q. Whence is it derived?

A. It is a product of the peridental membrane.

Q. Is there any way of knowing if a tooth be affected with exostosis?

A. The diagnosis is very uncertain. The gum over a tooth thus affected may be congested, or if any considerable deposit exists, a prominence on the alveolar ridge may be observed.

Q. Does the disease cause pain?

A. Not always. And teeth so affected are frequently free from tenderness even under percussion or pressure.

Q. Should pain succeed from the disease what is to be done?

A. Extraction

Q. Is this possible?

A. Not always. Sometimes the deposit is of such proportions that it offers the most serious impediments to extraction.

Q. What is the treatment for exostosis?

A. If it be possible to determine the presence of exostosis in its first formation, the administration of the iodide of potassium in large doses, and the painting of the gums, over the tooth where it is sup-

posed to exist, with a strong tincture of iodine or blistering this tissue with cantharidal collodian, has been advised.

Q. What is the dose of iodide of potassium?

A. From five grains to one drachm.

Q. What is meant by erosion of the teeth?

A. It is a wasting away of the teeth at the margin of the gum.

Q. What teeth are mostly affected by it?

A. The incisors and cuspids, although it is known to extend as far back as the first molars.

Q. Can you describe it more particularly?

A. It has the appearance of a channel, groove or rut formed by a triangular file; it does not discolor the tooth; it is generally above the enamel line; it is always highly polished; it occurs generally in strong, hard, dense flinty teeth; it is ordinarily insensitive, yet when it first makes its appearance exquisitely sensitive; it sometimes progresses until the pulp is laid bare; it sometimes attacks the teeth in other positions than at the gum margin; it sometimes occurs only on one side of the mouth. Teeth thus affected are at times very sensitive to the effects of heat and cold.

Q. What is the cause of the affection?

A. The cause has never been explained satisfactorily.

Q. What are some of the theories regarding it?

A. That it is the result of a chemical action; that it is produced by the too vigorous use of the tooth-brush.

Q. What is the treatment?

A. To form the eroded surfaces into cavities and to fill them with gold, should their progress show a disposition to expose the pulp.

Q. In this affection does not the pulp protect itself by the formation of secondary dentine?

A. It does, very frequently.

Q. Are there any other surfaces connected with this disease?

A. Yes; sometimes an abrasion of the cutting edges of the front teeth, extending back as far as the bicuspids, will be concomitant with erosion.

Q. Does this abrasion partake of the same nature as erosion?

A. To a certain extent, yes. The abraided teeth are highly polished and truncated so that the edges of the upper and lower teeth can not be brought together, but the depression, groove or rut, noticed in erosion when it appears at the gingeval line is not present at the cutting edges.

Q. Does the affection cause pain?

A. Ordinarily no. It produces discomfort when acid food is taken in the mouth and the teeth are susceptible to hot and cold liquids

Q. What is the cause of the affection?

A. The cause has never been explained.

Q. What is the treatment?

A. The only treatment is the restoring the wasted parts of the teeth with gold, or making gold caps and cementing these on to the abraided teeth, or of replacing the abraided teeth with porcelain-faced crowns.

Q The teeth being so prominent seem likely to be injured by blows, falls or other accidents?

A. Such is the case, but the same blow, or the same amount of violence will result differently in different cases.

Q. Why is this?

A. The state of the health, the character of the teeth and the condition of the body to morbid impressions, will have their effect on the violence of the blow. In one case a tooth may be loosened from the effects of a fall or blow, while no after bad results will follow, while the same accident in another case would lead to the death of the pulp, inflammation, suppuration or even necrosis of the socket

Q. Could such results be foretold by an examination of the teeth?

A. To a certain extent, yes. Strong, yellowish, compact teeth in the mouth of a healthy, vigorous subject, might have the tooth partly broken off, or considerably loosened, without any bad after effect, while teeth of a soft chalky consistency, vascular and highly organized in the mouth of a puny, delicate, scrofulous, unhealthy subject would have all of the evil results mentioned above.

Q. What should be done in the case of a fracture of a portion of a tooth?

A. If the injury be only a fracture of a portion of the tooth, the sharp edges should be filed smooth, or made so with a fine cut corundum wheel in the dental engine; but if it is loosened in its socket, it should be carefully ligated to the adjoining teeth until the parts heal and the tooth becomes firm again.

Q. Is this all that is necessary?

A. In certain cases it might be, but in others, as in the case of persons of an inflammatory diathesis, leeches should be applied to the gums, and such antiphlogistic remedies employed as to avert as far as possible subsequent bad results

Q. What do you mean by antiphlogistic remedies?

A. An agent or drug to thwart inflammation

Q. What are these?

A. Tincture of iodine, aconite, cold applications, &c., also the administration of antipyretics.

Q. What is an antipyretic?

A. A medicine to reduce the tendency to fever.

Q. What medicine would you use for this?

A. Antipyrin.

Q. What is antipyrin?

A. It is an alkaloidal product of the destructive distillation of coal tar.

Q. What does it look like?

A. A grayish crystaline powder, with a slightly bitter taste, and soluble in water.

Q. What is the dose?

A. For an adult from five to ten grains every two or three hours.

Q. What follows from the loosing of a tooth in its socket from the effect of a blow?

A. Generally a necrosis of the tooth. But a union will sometimes be established, after such an accident, between the membranes of the root and alveolus by an effusion of lymph, and the tooth retained in the organism.

Q. Can a tooth which has experienced such an accident be detected from the other teeth?

A. Yes. In the first place it is generally slightly longer, and secondly it is darker and more opaque, and has not the vital translucency of the other teeth.

Q. What should be done for such teeth?

A. To prevent the tooth from further discoloration, as soon after the accident as the tooth becomes firm in the socket, should it be a front tooth, an entrance to the pulp ought to be made at the "lingual pit," the pulp removed and the root canal cleansed and filled.

Q. Why would you advise this?

A. To prevent the infiltration of septic gases or the emanations of decomposition from the dead pulps entering the dentinal tubuli.

Q Suppose the tooth be knocked completely out of its socket, what would you do?

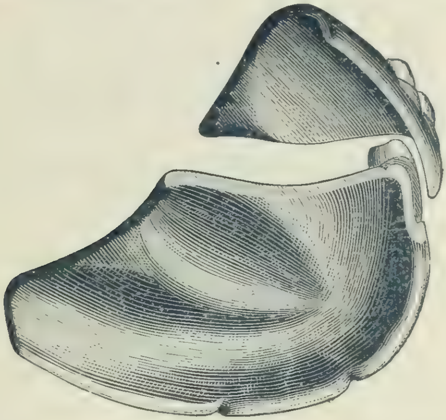
A. I would cleanse the socket of all adherent blood or clot, by frequent syringing with tepid water; I would wash the tooth with the same, and I would then reinsert it and either ligate it to the adjoining teeth, or secure it in its proper place and position by splints made of base plate gutta-percha, so as to hold it until it got firm.

Q. What treatment would you pursue subsequently?

A. I would apply leeches to the gums, and have the gums bathed with astringent washes.

A BROKEN PLATE WORN SEVERAL YEARS.

By C. S. Dusenberry, M. D., D. D. S., LeRaysville, Pa.



The patient for whom the illustrated plate was made is a daughter of Erin, now past 70 years of age. It was made in my office in 1866. The teeth were beautifully joined by my then student, since Dr. J. K. and later State Senator Newell. The old lady was then a widow, but later married an old settler of this place, for whom she faithfully cared in his dotage, receiving his savings by his will.

To my certain knowledge the plate was broken as shown, seven or eight years ago, and yet she continued to wear it until this summer. She would put the two pieces together, slip them into her mouth, and seemed to use them with comfort. Finally her daughter induced her to have the teeth reset, fearing she would swallow the smaller piece. The mouth has changed and I have often noticed the plate drop when she would laugh.

I remember when she was sick, we used to steal the broken corner, and claim it was lost, but she was too shrewd, and we had to deliver our spoil. Another point of interest is that the under teeth are nearly all gone, except a few stumps on one side. The mouth where the depression in the plate is seen is as hard as bone and the plate is set off. To my mind it is a lesson of what a person can do by practice, and a good thing to show some patients who are never satisfied with the fit of the plate.

PAINLESS AND HEROIC REMOVAL OF THE DENTAL PULP.

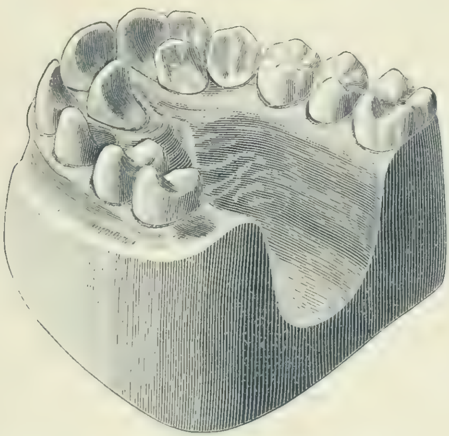
By F. S. Casper, Austin, Texas.

In your September number, page 149, appears an article on the "immediate removal of pulps," in which Dr. B. Q Stevens gives some good points. Although not new, they are nevertheless good; he might, however, have gone a little farther with the cocaine. The nerves of the teeth do not appropriate cocaine as readily as other parts of the system. You may inject cocaine into the gums, and it will only take from *one* to *four minutes* for it to have effect. The pulp of a tooth will not be anæsthetized in less than *ten* to *fifteen m nu'es.* In fact we always give it fifteen minutes, using it in the crystal form, only moist with a pledget of cotton dipped into a little tepid water. If the pulp is congested, it will require often times the second application to have the proper effect. After the second application has been made, should the pulp be still sensitive, and the operator can not use the broach, I will suggest a method which is, and has been, universally successful in my hands, with or without cocaine, viz: See that the pulp is fully exposed, keep all the parts thoroughly dry, take an old excavator aud file it like a smooth Donaldson broach, leaving it sufficiently large at the base of the broach to hold the heat, have the end of the broach quite sharp. If you have an assistant, let him hold the spirit-lamp close to the mouth of the patient. Everything being in readiness, heat the steel point *to a deep red*, and instantly thrust it on the exposed pulp; repeat the process until the pulp is entirely cremated; if your broach is *red hot*, you will have absolutely no pain, but do not use it if not *red hot*. You will find the blood will clog up the pulp cavity; this must be absorbed with bibulous paper or cotton. After this has been done, mix a little creosote and oil of cloves, equal parts, saturate the pulp cavity with this, and re-apply the heated instrument again; then thoroughly cleanse out the debris and proceed to fill root canal. We will give our method of doing this. Take a piece of orange wood, and with a sharp knife cut it four square, tapering to a sharp point, and a little larger than the root canal; now take a mixture of iodoform and the oil of eucalyptus, moisten the orange wood point in this, run a sharp knife around the wood point where you would have it break off. Insert it in the root canal and gently tap this wood point into the root canal until it has reached the apex, which can be determined by the sound produced by the tapping; now twist off the wood point, and proceed to fill crown cavity.

In conclusion, I wish to say, that any one who will give this method

a fair trial will not be much troubled with his "bread returning over the water."

CORRESPONDENCE.



We have received from our esteemed correspondent C. S. Dusenberry, M. D., D. D. S., of LeRaysville, Pa., the model of an abnormalty as represented by the above illustration. As will be seen, there are two well developed supernumerary lateral incisors.

Ordinarily supernumerary teeth are either stunted in their growth or are ill-shapen in form, but with these, the shapes are so characteristic of the ordinary lateral incisors, that it would be difficult to determine which are the normal or which the abnormal teeth; especially as the lateral incisors frequently take on this character of irregularity—namely, by erupting on the inside towards the roof of the mouth. The case is interesting, as a record of abnormal eruption, and at the same time representing teeth of normal shape in the abnormalty.—[ED

COMBINATION OF AMALGAM WITH CEMENT.

BY FRED A. BELLAMY, STREATHAM.

I was much interested in reading the paper on the combination of amalgam with cement by Mr. Wormald, reproduced in the last number of the *Journal*, for as far as I can ascertain I was the first to suggest and employ the two stopping materials in combination. I used them in this manner about nine years ago, and soon after that time I asked some of my *confrers* to try the method and pronounce an opinion upon it. This they did, and afterwards assured me it had special merits and had proved of great service to them. It was not,

however, until I had given it a fair trial and was convinced of its value that I deemed it worthy of print, and in February, 1887, I gave a short description of the manner of its employment in the *British Journal of Dental Science.* Since then the same idea has been *re*-invented again and again, by different dentists, who apparently do not read the dental serial literature, or confine themselves to one pet publication, each, too, oblivious that "there is nothing new under the sun," and possibly I may one day learn that my original idea was old before it was conceived.

I feel bound to take exception to the opinion expressed in the paper in question as to the value of this matter for color-improving purposes, for the mercury contained therein will certainly stain the tooth (more or less) in due course, and consequently a stopping must be made much too light to allow for subsequent discoloration, and thus imperfectly match the color of the tooth to begin with; or if sufficient amalgam be incorporated with it to insure it harmonizing with the tooth to commence with, the stopping will, ere long, become much darker than the tooth, and the latter probably become stained to disfigurement. This combination, then, cannot be considered as adapted for front teeth.

Now, after a very extended application and continual experimenting, I have no hesitation in saying that any of the first class amalgams, whether they be fine or coarse cut, are equally reliable for this purpose, and I have also used copper amalgam in the same manner for soft back teeth, with the best of results. As to using a *specially prepared fine grain amalgam, so that it will mix more thoroughly with the powder, and thus be more perfectly incorporated by the fluid*, I have failed to observe any necessity for it. The combination, though not perhaps wholly a chemical one, is not altogether a simple mechanical mixture, and when mixed, should produce a perfectly homogeneous mass, of which no individual ingredient can be discovered. I feel safe in asserting that the combination, if properly prepared, will endure much longer than any simple white cement, and faced with amalgam in the manner I have advocated is equal to a pure amalgam filling. I have always kept a faithful record of all stoppings, &c., performed by me, and I never lose an opportunity of comparing the same with a later examination of the mouth, and I can thus fairly approximate the durability of the different cements and combinations. It should also be borne in mind that these combination plugs can be inserted in cavities where it is generally supposed that cement alone is the only stopping available, and where the existing shape of the cavity would defy the retention of a metal plug.

I originally stated that any of the oxychlorides would answer for this purpose, and I now go further, and include the oxyphosphates, though I still give preference to the former, as they assist the amalgamation and tend to make a more plastic substance. When the cavity is filled with the material, the surface of the stopping may be scraped away and the edges pared quite clean, forming a shallow cavity which should be filled with amalgam proper. Though the combination may have set quite hard, the amalgam will readily unite with it if a small quantity, mixed with rather an excess of mercury, be first planished upon the surface, and the stopping should then be finished with amalgam in the usual way. No practitioner would adopt this plan as his general method of treating cavities, but it is indisputably a useful adjunct to the already existing means of stopping teeth with frail walls, &c. One feature of this material which should commend it is its "stickiness," which enables one to stop teeth where groves or undercuts are altogether wanting. For temporary teeth especially, where a child seems averse to the excavator or bur, very little preparation of the cavity will suffice; and if mixed with copper amalgam, it becomes endued with the antiseptic properties of the latter, and a tolerably good stopping may be obtained with the minimun amount of discomfort to the little patient, and which will last as long as the tooth should be retained.

To quote the instructions I gave on page 118, No. 457 of the *British Journal of Dental Science* may still interest a few:—"Having prepared the cavity, mix the requisite quantity of amalgam with rather more mercury than for an ordinary amalgam filling; then take about one-fourth of the bulk and squeeze the surplus mercury therefrom—this drier portion to be reserved for finishing or coating the stopping. Next mix the osteo stopping upon a slab as usual, and when thoroughly mixed, quickly add the remainder of the amalgam, working the two into a plastic mass which is then ready for the cavity. Three-fourths of the cavity I fill with this hybrid substance, employing the ordinary amalgam I had retained for the purpose for completing the stopping. When the amalgam and osteo are mixed to the right consistency the result is a concrete possessing an extraordinary adhesive quality, which is of invaluable service in filling a certain class of cavities. Perhaps I have found it most welcome when filling saucer-shaped cavities on the buccal surfaces of lower wisdoms; but in most cases, where sensitive dentine or extreme nervousness of the patient defies thorough excavation and scientific shaping of a hollow for the retention of a metal plug, it is a very useful 'wrinkle' for the dental surgeon."—*Journal of the British Dental Association.*

A VALUABLE USE FOR COPPER AMALGAM.

By T. F. Chupein, D. D. S , Phila., Pa.

We glean from the English journals (we regret we have been unfortunate to lose the issue) what we think a valuable use for copper amalgam. It is in the aid it offers in the construction of a plaster model whereon a band or ferule is to be accurately fitted to the face of the root. Or even where a clasp is to be nicely adjusted to the tooth it is to encircle, the suggestion affords a valuable aid to the workman.

The root end being prepared, an impression is taken with plaster of Paris. The depression in the impression representing the root end is

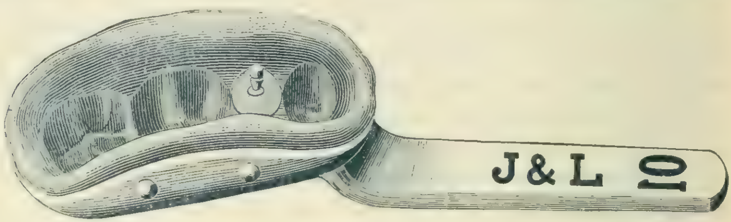


Fig. 1.

filled with softened copper amalgam and a piece of brass wire filed to a double headed pin, or bent into the form of the letter Z, is pushed into it as shown by Fig. 1. The copper amalgam is permitted to set, after which the impression is filled with plaster in the usual way.

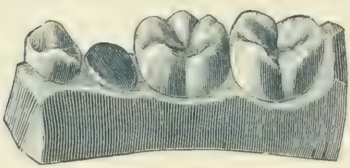


Fig. 2.

When hard the impression is cut away and the model produced, as shown by Fig. 2.

The root end, to which the band is to be fitted will be of hard copper amalgam, which will not wear away when this is being fitted.

The procedure is the same when copper amalgam is used to fill the depressions in the impression which represent the teeth that are to be clasped.

The copper amalgam may be recovered from the model, after the work on the model is finished, and used over and over again.

COCAINE.

Dr. L. C. Wasson, Topeka, Kan., read the following :

Mr. President and Gentlemen :—At the last meeting of this society a resolution was passed instructing a committee, of which I was one,

to make separate experiments with cocaine, for the purpose of determining its value as a local anæsthetic in the dental office. At that time, as many of you will remember, some discussion was had on the subject, and a great variety of opinions were expressed ; some claiming that cocaine was a most charming anæsthetic ; others that it was of no value, and there were a few that claimed that cocaine produced necrosis of the aveolus. That it was very uncertain in its action, and quite liable to produce dangerous constitutional disturbance, and therefore ought not to be given a place in the dental materia medica.

In looking over our dental and medical journals of the day, I have found quite as much difference of opinion among those who have written upon this subject. One author says he has used as much as six grains without getting toxic effects, and that he does not hesitate to inject two or three, or even six grains, if the exigencies demand it; while another writer says you should never inject more than one or two grains.

M. Recluse, a celebrated French surgeon, reports eleven hundred cases where he has injected cocaine in all parts of the body for surgical operations, without a single accident, and many others bear like testimony. But it is not to be denied that there have been some accidents with cocaine, whether they are the fault of the drug, or the injudicious use of it, I am unable to say. It is also true that accidents have happened with chloroform, ether, morphine and a hundred other of the most potent remedies in the materia medica; and yet no one thinks of discarding them simply because their use is sometimes attended with unfavorable results.

That there is urgent need for a reliable local anæsthetic, no one will deny. Many things have been tried and found wanting. To-day there is nothing that I know of that gives promise of filling a long felt want, as does cocaine. That its use and physiological action is not understood is undoubtedly true, else there would not be such a wide difference of opinion as to its value as a local anæsthetic.

I have used cocaine in operations of the mouth one hundred and sixty times, with varying success ; one hundred and twelve times upon females of all ages and conditions, and forty-eight times upon males. In my earliest experiment I used a two, four and ten per cent. solution. I soon abandoned the two per cent. solution because I found it unreliable, and commenced using a ten per cent. solution, but found that I could get equally as good results with the four per cent. solution, and greatly lessened the danger of getting toxic effects. I have rarely, however, failed in greatly lessening the pain of extrac-

tion, and in a majority of cases the anæsthetic was complete, and the operation performed almost, if not quite, painless. I can hardly remember an instance where the patient did not express himself or herself as greatly pleased with the action of the cocaine, even though they did not get toxic effects.

In those cases where I failed to get the desired results, it may have been because of faulty manipulation on my part, although I think it quite probable that there are cases where I could not get the cocaine deep enough into the gums to produce perfect local anæsthesia, for the reason that the alveoli are dense and hard, and the roots unusually long.

Cocaine is undoubtedly local in its effects, and does not reach beyond a very small radius, except where it is injected into the tissue and carried into the general circulation; in which case we are liable to have constitutional disturbance, which, to say the least, is annoying and unpleasant, although I do not believe it to be as dangerous as many who have written upon the subject, from the fact that so few deaths have occurred.

I had an experience, however, in two cases that was very surprising to me, and not all satisfactory. Early in the month of June last, a young man was brought to my office who had had one of his superior central incisors broken off at the margin of the gum by a blow. The pulp was exposed and bleeding, and as there was no possible way of securing the preparation of nerve paste, I decided to inject the pulp with a four per cent. solution of cocaine, which I did, and in a few minutes removed the pulp painlessly, greatly to the relief of my patient. After cleansing the root I dressed it with a preparation of wood-creosote, and packed it with carbolized cotton, sealing it with chora-percha. I carefully examined the root and gum for a fracture of the alveolus, but could find none. I dismissed my patient with instructions to call again in a week, intending to put a crown on the root at that time. When he returned at the end of the week, he complained of tenderness about the root. In trying to remove the dressing, the root dropped from its socket, and a few days later I removed several pieces of the alveolus, all showing unmistakably, signs of necrosis.

The other case was that of a young lady who came to my office complaining of pain in the region of the superior bicuspids, on the left side. Upon examination I found the pulp dead in the first bicuspid, and in the second the pulp was exposed and apparently in a dying condition. I injected it with a four per cent. solution of

cocaine, and in a few moments removed it without pain, dressed the root in the usual manner, directing the patient to call again in a few days, which she did, complaining of tenderness of gums about the two teeth which I had treated. Much to my surprise I found the superficial plate of the alveolar process necrosed and completely honeycombed, so that when I used the syringe to wash the inflamed parts, the water came out through two or three fistulous openings in the gums. Query: Did cocaine have anything to do with producing necrosis in either case? If so, why have I not had other cases where I have injected the cocaine directly into the aveolus hundreds of times? These cases came near together, and they, in connection with the fact that I got frequently toxic effects where I least expected, did much to shake my faith in cocaine, though I felt loth to discontinue the use of a drug that seemed such a valuable adjunct to my practice.

I wrote letters to some of the most celebrated surgeons of the country, and got as many different opinions as I did letters; no two of them agreeing.

About this time I learned from one of the prominent specialists of our city that he was using a preparation of cocaine with which he was getting much more satisfactory results than when using cocaine alone. He assured me that he had never seen a case of constitutional disturbance since he had been using it, nor had he had any other unpleasant results. This put new hope into me, and under the promise of secrecy I secured his formula, and commenced at once to use it; since which time I have injected the solution sixty times without a single case of constitutional disturbance, or the least unpleasant results.

By permission of the gentleman from whom I obtained the formula, I am enabled to give it to you:

Cocaine hydrochlorate, ...	gr 20.
Sulphate of Atropia, ...	gr 1-10.
Carbolic Acid, crystals, ...	gr 10.
Chloral hydrate, ...	gr 5.
Aqua pure, add one ounce.	

You will naturally inquire why the addition of the atropia, carbolic acid and chloral, make the use of cocaine less objectionable. I will try to explain: 1. Atropia, in small doses such as you give in hypodermic injections from this preparation, is a cardiac, respiratory and spinal stimulant, which tends to counteract the toxic effects of the cocaine. 2. Carbolic acid aids the chloral in localizing the anæsthe-

sia, and both tend to increase the anæsthetic properties of the cocaine and localize the effects, and both aid in the preservation of the solution, which is of itself quite desirable, as the ordinary cocaine mixture is almost worthless at the end of a week, while this preparation is good for months.

In extracting, my plan is as follows: 1. Fill the barrel of the hypodermic syringe with the fluid, then adjust the needle and make sufficient pressure on the piston of the syringe to force a few drops through the needle. By this means you obviate the danger of injecting air into the tissues. Begin at the margin of the gum on the labial side, introduce the point of the needle, and gently push it into the gum tissue on a line with the roots as nearly as possible, and when a depth has been reached corresponding with the length of the roots, the needle should be slightly withdrawn in order to produce a small space or pocket into which five or ten drops of the fluid should be forced. Before the needle is withdrawn a slight pressure should be made upon the gum opposite the point of the needle. This scatters the cocaine and hastens its absorption by the alveolus. A similar injection should then be made on the lingual side of the tooth. If in withdrawing the needle any portion of the fluid should escape, the patient should be directed to rinse his mouth. I usually wait from five to ten minutes after injecting the gums before extracting.

The amount of cocaine injected varies from one-half to two and one-quarter grains. If there is a number of teeth to extract, and conditions favorable, I do not hesitate to use a second syringe full of the fluid, or a total of sixty minums; but this is the limit; I never go beyond it. The extraction of the teeth of course liberates a large part of the cocaine, hence more of it may be used for this purpose than where there is to be no bleeding. Should you get toxic effects with this preparation, administer a stimulant; one of the best is dilute alcohol.

I have heretofore spoken of the use of cocaine for extracting only, but it is quite as valuable in the operating room, as at the extracting chair. In making deep buccal or proximal fillings, you can save much of the pain, as well as win the confidence of your patient, by injecting the gum with a few drops of cocaine before adjusting the dam. It is also invaluable in the treatment of pyorrhœa, and other inflamed conditions of the gums about the necks of the teeth. In short, cocaine intelligently used will rob dentistry of half of its terrors, and win the grateful commendation and esteem of your patients.

Discussion opened by Dr. E. P. Mossman, Oswego, who said: "I

feel complimented by being asked to open the discussion, but don't feel equal to the occasion. I want to thank Dr. Wasson for the paper he has given us. The drug is one that I have not had much experience with. Don't see how I could do any good by trying to discuss it."

Dr. C. E. Esterly, Lawrence : " I think Dr. Wasson has given us a very accurate paper and one that I fully appreciate. If those who formerly had unpleasant results in the use of cocaine will follow his advice it will be of great service. Those operations about the gum which are quite painful, can be done painlessly by using it. I don't know that I have ever had any exfoliation of the alveolar process from its use, but I know there must be something that would tend to produce that result, whether it would be from the needle, or drugs, it would be hard to tell."

Dr. A. H. Thompson : " The paper is very interesting and valuable and I hope Dr. Wasson will continue his interesting experiments and give us more next year. I have used it to some extent, but not by injection ; I am afraid to attempt that. Have used it in external applications. Have used it on the gums and it was particularly useful in one place which I want to mention. That is in taking an impression of those mouths where the palate is sensitive. In some cases you are prevented from taking a correct impression. I find that by brushing throat and palate with cocaine, it absolutely prevents that sensitiveness. Recollect one case where I made a plate for a lady and did not get the impression I liked because I had to take it out too soon. She had never had a good fit. I did not get a good fit the first time, and the next time I tried cocaine and got a good fit. In other cases I have used it with benefit."

Dr. Roberts : "How do you apply it?"

Dr. Thompson : " Just brush with pencil and apply it?"

Dr. H. W. Davis, Ottawa : " Dr. Wasson referred to other operations in which he used it. I suppose you meant manipulation of gum and in cavity, did you not?"

Dr. Wasson : " The object was to save pain by holding gums out of the way while you were making a deep buccal filling. It relieves pain almost entirely to inject a small portion into the gum. Wherever there is tartar to remove, you will find that a few drops of cocaine injected into the tissues will relieve the pain almost entirely. If this preparation is used, it does not become inert. I have a preparation that has been mixed up sixty days."

Question :—" Would like to ask Dr. Wasson whether he injects for temporary teeth, and the effects with children?"

Dr. Wasson: "Never used much on children; would not inject so large a quantity."

Dr. L. D. Hodge, Arkansas City: "Have been using a solution without injection at all. Just applying on cotton, and it works admirably. Also for lancing the gums; used it on my own child eighteen months old; take four per cent. solution of cocaine."

Question:—"You would not take a highly sensitive pulp and stick a needle in it?"

Dr. Wassson: "By injecting into that pulp you can easily do it."

Dr. Thompson: "What about sensitive cavities?"

Dr. Wasson: "In those I get no beneficial effects, but where put into the tissues, it is a paralyzer; has no perceptible effect on the bony structure."

Dr. Thompson: "Using it on the gums, it may effect the tongue and cheeks before it does the gums, and that makes it more difficult to use it."

Question: "Would injection into the gums render exposed pulp less sensitive?"

Dr. Wasson: "Don't think it would. In answer to Dr. Thompson would say: that in most cases where used in the gums but little effect takes place, unless you scatter or produce absorption, for it will leak out into the mouth and you have simply a local application into the gums and parts around. I introduce the needle and then withdraw and leave a little pocket. Into that I force the cocaine and then, before there is any chance to leak out, put finger against gum and force it out into the other tissues. In that way very little will escape. Sometimes I have to hold my finger over the place to prevent it leaking out. If you will force the cocaine down where you want it and hold it there, you will get desirable results. I don't mean that it is a perfect anæsthetic in all cases, because they all fail sometimes. I saw chloroform administered for neatly an hour and it had apparently no effect on the patient. It is often difficult to get it deep enough into the gums to get the local effects where you want them. If that is the case, prepare with carbolic acid, which is also an anæsthetic and an albuminizer. Chloral answers the same purpose; there is no reason for using both, except that both are local anæsthetics and both seem to prevent' the cocaine from being absorbed. Dr. Guibor says that he has never seen a case of constitutional disturbance, at any time, from using it. His rooms are filled almost all the time. He is a specialist in the treatment of the nose and throat; has quite a reputation among us; spent thirty years in the practice of

medicine and then took up his specialty; uses it much oftener than I ever have and has found it to act charmingly.

Another point is in regard to cocaine locally applied on cotton. I could not get satisfactory effects, because it was not deep enough; mixed with the saliva and only distributed locally. You will get more benefit to use cocaine hypodermically. Where I had to depress gums for deep proximal fillings, have surprised my patients. If they believe that they are going to get benefit, they are very apt to imagine that they do get benefit. People often come into your office and ask if you use cocaine? I have used it wherever possible without the knowledge of my patient; where I have had to dissect the gum away, I have quietly injected a few drops of the cocaine, and in one-half of the cases the patient has asked, 'how did you manage to do that without hurting me?' In cases of pyorrhœa or removal of tartar, teeth are sensitive about the necks. Inject cocaine and you can do that work almost painlessly. You don't get as quick effect on inflamed surfaces or on chronic inflammation, as in pyorrhœa or where you introduce it into healthy tissue; have to wait a few minutes before you get anæsthetic effects."

Question:—"Do you ever get toxic effects?"

Dr. Wasson; "I have tried to conduct experiments on people of all conditions. The worst toxic effects that I ever got was upon a man as large as myself. Before I could get the window open the fellow keeled over and I had a genuine case of constitutional disturbance. But I have used it many times on delicate and frail ladies and could see no difference between the effect with them and strong men. If I had to use it alone, should be loth to use it, but with my experience and the experience of my friends I have an anæsthetic which is of great benefit."

Dr. F. O. Hetrick: "The worst constitutional disturbance I ever had was with a large healthy man, who never had a sick day."

Dr. H. W. Davis: "The larger the man, the bigger the coward. Speaking about getting effects from cocaine, I practiced upon a medical student. He had two cavities in cuspids. He was very timid. I injected a solution into the supra orbital foramen. You can get good effects there, where you get it into the nerve, as in the gum."

Dr. A. H. Thompson: "Speaking of the injection at the exits of the nerve, you can produce paralysis, but there is too much danger of producing permanent paralysis. Where the roots are very sore from inflammation, apply the preparation over the gum and you get good effects in that way."

Dr. Burkett: "My experience has been unfavorable, and have tried it almost every way I could. Tried to extract pulp in crown cavities with rubber dam over; put crystals of cocaine right on the nerve, and had no effect whatever. Remember a case where a gentleman came with a tooth broken off just at the pulp chamber and alive, an inferior bicuspid. I tried to extract pulp before I extracted root. It was so sensitive I could scarcely touch gum or tooth; finally concluded I would cut it off. When I got through, waited five minutes and repeated, and waited another five minutes between. Took an excavator and slipped the top off and had no more trouble with the root. Have the first time yet to have any effect on pulp or root. I used it as clear as crystal."

Dr. Wasson. "I had hoped that something would have been said about my failures and I will not take the time of the society any further, because I have no opinion about it. I reported it as one of my failures."

Dr. McCarter: "Dr. Wasson has such faith in his new formula that I see no reason to discuss the failure; that was when you used the cocaine alone." [Discussion closed.]

THE PRACTICAL PLACE.

Gleanings.

Dr. C. Sill, of New York, demonstrated a method of using oxyphosphate of zinc for the purpose of obviating any irritant action by mixing *one part* of petrolatum with *eleven parts* of oxide of zinc, and then combining with the liquid made somewhat thinner than usual. Thus prepared it seemed to make a very hard filling.—*Cosmos.*

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Dr. E. C. Kirk claims wonderful results in pyorrhœa alveolaris by the use of aristol. He says: "All attempts to remove the deposit were rendered futile at this sitting by reason of the extreme looseness of the teeth and soreness of the tissues. As a preliminary treatment, therefore, an application of aristol was made as follows: A ten per cent. solution approximately of aristol in oil of cinnamon was made by rubbing the drug up with the oil on a glass plate by means of a spatula, and with this solution threads twisted from a wisp of absorbent cotton and cut into half-inch lengths were saturated, and gently carried by means of a blunt probe to the bottom of each suppurating pocket, the effect being made at the same time to encircle the root at the base of the pocket with the medicated thread.

After each diseased alveolus had been so treated, the case was dismissed for twenty-four hours.

The result shown at the next sitting upon the following day was most gratifying as it was surprising, for all inflammation, of an acute type, had subsided; there was an entire absence of fetor, the flow of pus had entirely ceased, and the soreness had so completely vanished that thorough removal of the calcareous deposits was undertaken and carried out at this sitting as far as the limits of time would allow. An application of aristol in cinnamon oil, as in the first instance, constituted the final dressing, and no other medicament was used during the treatment, with the exception of aromatic sulphuric acid, which was applied after the mechanical treatment by scales, for its solvent action upon any small granules of tartar which escaped the action of the instrument. The case was treated weekly for about two weeks, and the improvement which took place at first has gone on steadily.

I have made use of aristol in connection with root filling materials by another method, which so far has yielded satisfactory results, but the cases are too limited and insufficient time has elapsed to enable me to report fully upon the value of the method. A strong solution of aristol is made in the oil known to house-painters as "japan dryer," sufficient of the drug being added to make the liquid somewhat thinner than glycerine. Into this is worked with a spatula freshly calcined oxide of zinc until the mass is like putty, in which condition it is worked into the root-canals. In the course of a few days the mass becomes quite hard, and seems to fulfill admirably the requirements of a root-filling.

* * *

Not the least interesting and altogether satisfactory application of aristol in dental practice is the use of its chloroform solution instead of sandarac varnish for saturating cotton used for wedges or temporary stoppings in retaining medicaments during treatment. A pledget of cotton saturated with aristol dissolved in chloroform, upon evaporation of the solvent, has its fibers held together by the peculiar resinous character of the aristol, in which condition the pledget fulfills the physical requirements of a cotton and sandarac wedge, but with the special advantage that it is entirely antiseptic, which in this instance means more than might at once appear. Such a dressing or wedge may be retained in the mouth for days or a full week, and when removed is entirely free from offensive odor, while the peculiar fetor which arises from a similar application of cotton and sandarac var-

nish is a constant drawback to its use, sufficient to bring about its disuse by many operators because of the annoyance to themselves and their patients.—*Ibid.*

* * *

Dr. Gottschaldt —For some time I have tried a mixture of cement that is very thin—thinner than usual—and chloro-percha in sensitive and deep cavities, and I have found it of great benefit. It is easily introduced, and will stay where you put it, and it will harden in three minutes at the most without decreasing in bulk or curling up. It has proved very satisfactory in temporary teeth, and it does not seem to matter whether the tooth is perfectly dry or not; it sticks there quite well. I do not know whether this is new or not, but I hope those who have not heard of it will give it a trial.—*Ibid.*

* * *

Absolute Alcohol.—It is quite expensive to buy absolute alcohol for general use. I heat four ounces of sulphate of copper until it is thoroughly dried, and then add it to one pint of commercial alcohol, and shake the mixture thoroughly and let it stand for a few hours. The salt takes up the water and turns blue.

Alcohol treated in this way answers most purposes where absolute alcohol it wanted. The same salt can be dried and used over again for another quantity of alcohol.—*Ibid.*

Fœtid Breath.

The Revue Générale de Clinique et de Therapeutique gives the following prescription for the relief of this condition :

R.	Saccharine, ...	
	Salicylic acid, ...	
	Bicarbonate of sodium aa. .	xv grains.
	Alcohol, ...	j ounce.
	Essence of peppermint, . .	x drops.

A teaspoonfull of this is to be placed in a wineglassfull of hot water and used as a gargle once or twice daily.

Paraffine in Oxyphosphate.

Dr. Geo. Evans says: A few weeks ago, Dr. Bonwill made the statement that he had discovered the means of entirely preventing the composition of oxyphosphate fillings by thoroughly saturating them with heated paraffine, which melts at a much lower temperature than

wax. I have not tested it conclusively, but I think the idea is a very valuable one. I had occasion to put in some of these fillings some time ago, in teeth the pulps of which were very nearly exposed, and thought it a good opportunity to make a trial of paraffine as suggested. I shall continue the test, and watch carefully the conditions. Dr. Bonwill claims to get very good results from its use, saying that it renders the surface of the filling and interstices around it impervious to the action of acids.—*First District So. in Cosmos.*

Anæsthetic.

A dentist, whose stories are always founded on fact, tells of a negro who came to him with his wife to have one of her teeth extracted. Gas being something whose mysteries added terror to its charms, the solicitous darky questioned: "Couldn't you gibe her suffin' a little milder'n gas, doctah? Couldn't you gibe her gasoline?"—*Pharmaceutical Era.*

A dog, near Hannibal, Mo., was bitten a few days ago by a copper-head snake, and was cured by ammonia, given internally, and a mixture of ammonia and carbolic soap applied to the wound.

CORRESPONDENCE.

At the last regular meeting of the Brooklyn Dental Society, held on Monday evening, September 28th, Dr. E. K., of New Orleans, read an *extremely brief*, but interesting essay. The subject was: "How May Our Profession be Made More Profitable?"

The essayist said, in a categorical tone, "How may our profession be made more profitable?" Why, simply by working like the devil and doubling your fees.

As the essayist was about to resume his seat, President R. O. said: "Is that all? Dr. R——'Is that all!!!' Isn't that enough?"

THE SOUTHERN DENTAL ASSOCIATION.

This body of dentists met in the building of the Teachers' Assembly, at Morehead City, in the State of North Carolina. The meeting was presided over by its genial president, Dr. G. F. S. Wright.

The meeting was well attended, and the papers presented elicted the interest of the members present and received their well-merited discussion.

The clinics, illustrating practically many of the most important

operations, were profuse and numerous, and were presided over by experts.

Harrogate, Tennessee, near the Cumberland Gap, was selected as the next place of meeting.

The following officers were elected for the ensuing year:

President, Gorden White, of Nashville, Tenn.

First Vice President, E. L. Hunter, Enfield, N. C.

Second Vice President, I. T. Calvert, Spartanburg, S. C.

Third Vice President, W. H. Marshall, Oxford, Miss.

Corresponding Secretary, Dr. R. Stubblefield, Nashville, Tenn.

Recording Secretary, H. C. Herring, Concord, N. C.

Treasurer, Henry E. Beach, Clarksville, Tenn.

Members of the Executive Committee, E. B. Marshall, Rome, Ga.; W. B. Richards, Knoxville, Tenn.

The last Tuesday in July, 1892, was decided on as the date for the next meeting.

BOOK NOTICES.

We have received from the publishers—Messrs. J. B. Lippincott & Co.—the September number of "Lippincott's Monthly Magazine." The issue is replete with very interesting articles, as well as its peculiar feature—the full publication of a novel by Ruth McEnery Stuart, "Carlotta's Intended." Besides this, the magazine is embellished with an excellent engraving of the favorite, popular and winning young actress, Miss Julia Marlowe, with an accompanying excellent and just criticism of the lady as an actress. We recommend this very worthy monthly magazine to the reading public.—[Ed.

Questions and Answers on Dental Pathology and Therapeutics, Dental Embryology, Hygiene and Care of Children's Teeth. By Gustavus North, A. M., D. D. S., Professor Dental Pathology and Therapeutics, Dental Embryology, etc., etc., in the American College of Dental Surgery, Chicago, Ill.

The design of the above work is to aid the dental student in his studies. We commend the book to him. The categorical systems we have always held to be the best to impress certain studies on the mind, and the information contained in the work is so concise and succinct that both the question and answer are readily retained. The book, too, appeals to the popular taste, as it contains much which any community may readily learn or study with profit, yet some points that are not generally recognized.—[Ed.

General Index for Vol. V.

THE

Dental Office and Laboratory.

FOURTH SERIES.

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TENTH PAPER.

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

(Continued from page 168, Vol. V, No. 6.)

EXTRACTION OF THE TEETH.

The extraction of the teeth is an operation which should only be performed as a last resort. The great strides which have been made in the treatment of diseased teeth, to make them comfortable and useful, and in the making use of even the roots of teeth for the support of crowns for the service which they perform in mastication, show the folly of consigning, even roots, to the ruthless forceps. True, in the case of relieving a crowded condition of the dental arch, or for the correction of irregularity of position, good teeth, free from decay are sometimes extracted.

We will begin our directions, for the extraction of teeth, from *the third molar or wisdom tooth* on the right side upper jaw, taking each tooth separately, until we come to the right upper central incisor; the extraction of those on the left side being almost if not quite similar.

The position of the operator should be on the *right side* of the patient. Before making any attempt, the tooth should be examined. If it can be seen by direct view this will be of advantage, if not it should be examined by the aid of the mouth mirror. As much of the decay should be removed as possible (if this be either on the palatal or buccal aspects of the tooth), and a survey made as to what points offer for the best application of the forceps. True it is, that in the extraction of any tooth, dependence for the hold of the forceps should never be *placed on the crown*, yet by the cleaning away of as much softened tissue as may be, a better condition of the tooth is made for the application of the forceps. The third upper molar is not ordinarily a difficult tooth to extract. Very frequently the roots *are fused*

into one, and when this is the case they present so conical a form that its dislodgment is easy. If they are not thus united, its roots are ordinarily short, with very little spreading at their bifurcation. The instruments for the extraction of the wisdom teeth is shown by Fig. 165. The tooth should be seized *well up on the neck* by forcing the forceps well up under the gum. When applying the forceps, the

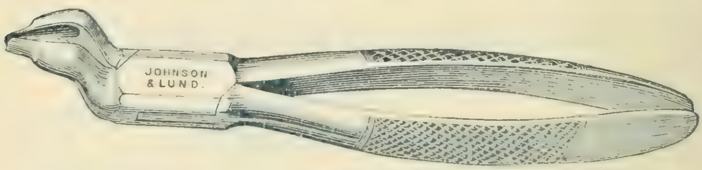


FIG. 165.

left arm of the operator should be thrown around the head of the patient, and this part of the anatomy held almost immovable in the operator's grasp. If the roots be conical a rotary motion will make the tooth slip or jump out of its socket, if not an outward movement towards the cheek will dislodge the tooth, ordinarily without much

FIG. 166.

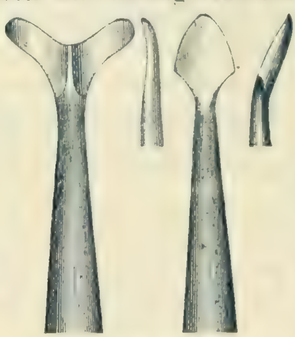


FIG. 166.

effort or trouble. One or the other of these movements may be made, to determine which will dislodge the tooth in the shortest time and with the least pain. Sometimes the roots of these teeth have a decided crook or curve backward, which resist either the outward movement towards the cheek or the rotary movement. In such a case, an elevator, such as is shown by Fig. 166, placed between this tooth and the second molar, using the later tooth as a fulcrum, and giving the handle of the instrument a motion towards the back of the mouth will make the tooth follow the force of the curve and dislodge it. It is rarely necessary to cut the gum in order to extract a tooth; but as the gum around the third molar is frequently quite tough and adherent, severe cases of tearing or laceration of this tissue, have been known to occur, especially on the distal aspect of this tooth, if this precaution is neglected. A gum lancet, such as is shown by Fig. 167, will be found of service for this dissection of the gum, the middle blade of which applies well to the

distal, while the lower blade applies well to the buccal and palatal surfaces, should it also be found necessary to cut at these points.

The first and second molars are ordinarily more difficult to extract. Two pair of forceps (one for the right and one for the left side) are indispensable for these teeth. We have found those shown by Fig. 168 of great utility for either of these molars. The design of these forceps is not to seize the crown at all. The handles of the instruments are marked "Right" and "Left," showing on which side of the mouth they are to be used. The blade with the "two horns" is applied to the *palatal root*, while the "single horn" passes in and insinuates itself be- the two roots, which lie towards the cheek. In this way no impingement is made on the crown,

FIG. 167.

and though the crown may be almost, if not entirel , ecayed away, these forceps apply admirably in either case. We particularly advise these forceps *as they are represented, with no crook in the handles.* Should the gum be tough on the buccal surface, it may be cut *on a straight line* in the direction of *the long axis of the teeth,* the better to apply the single horn of the forceps, so it will impinge at the bifur-

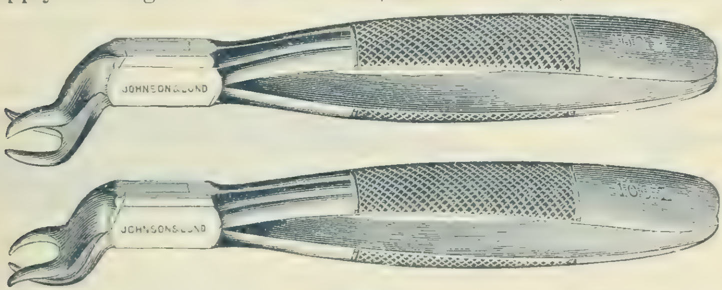


FIG. 168.

cation of *the two outer roots.* The same directions apply for the application of the forceps, the position of the operator, &c., as in the other case. The forceps should be held as near the joints as possible. If held too low down, near the ends of the handles, there is so

much leverage that the crown is apt to be broken, leaving the roots in their sockets. The tooth is first loosened in its socket by using an inward and outward motion, *principally and more forcibly the outward*, as the alveolus is weaker and thinner and more springy or elastic towards the cheek. But while this motion is given with a view of loosening the tooth in its socket, a traction force or *pulling down-*

FIG. 169.

ward is also to be kept up so as to dislodge the tooth. It is often the case that the crowns of these teeth are so consumed by decay that there is little tooth tissue of the crown left to hold the roots together, and that on the application of the forceps, with the effort to extract, there is not strength enough left in the tissue that binds the roots together to bear the force of the forceps in the seizure. Under these circumstances it will be best to separate the roots (which most probably may occur in the application of the forceps Fig 168), after which the roots may be removed separately. In doing this it is best to remove

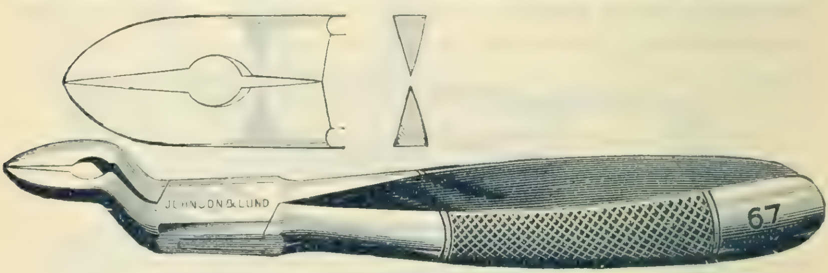


FIG. 170.

the *palatal root first* and afterwards (separately) the two buccal roots. For removing these roots the forceps Fig. 169 will be found to apply well. Should it not be the case that forceps No. 168 fail to separate the roots, these may be separated with the forceps Fig. 170. In removing the roots, the forceps must be insinuated well up on to the root, so the beaks will seize a sound part. If this be not done the

root will chip and chip at each effort to seize it, leaving it so rounded that no seizure can be made.

The Bicuspid teeth may be removed with a straight pair of forceps like Fig. 171. We prefer this style, as they may more readily be insinuated beneath the free margin of the gums so as to get a firm grasp on the neck of the tooth or higher if possible. To remove these teeth the position of the operator is on the right side. The patient's nead is well supported in the head rest, the operator's left arm is thrown around the patient's head. The fingers of this hand may draw the lips away, so as to see well where and how best to apply and to grasp the tooth, whether the tooth be on the right or left side. The tooth is loosened in its socket by using the "in and out" motion, the greater effort being made outwardly, for reasons stated in the removal of the molars. Regarding this loosing of the teeth before removal, Dr. Stellwagen says, "Indeed, it is the practice of this slow

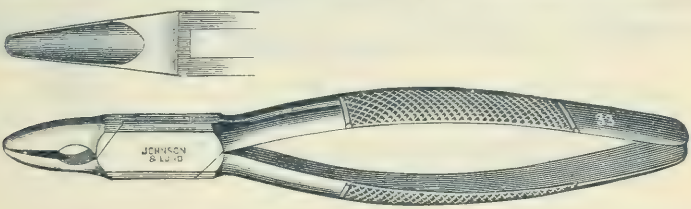


FIG. 171.

movement and stopping each time the patient wishes a moment's relief that has made the small amount of pain suffered by the patient often a matter of the most agreeable surprise. Remembrance of this cannot be too much urged upon the operator who would succeed as an extractor of teeth; it is the greatest means of extracting without pain, the safest local anæsthetic." Too much caution cannot be given regarding the seizure of these teeth (indeed of all teeth that are to be extracted) as high up towards the borders of the alveolar process as possible.

The cuspids or eye teeth. These teeth are always the most difficult to extract. Their roots are longer than the roots of any of the other teeth, and they are the most firmly implanted in the jaw and difficult to loosen. The forceps shown at Fig. 171 are also used for the extraction of these teeth. In the efforts to loosen and dislodge them a rotary or twisting motion, combined with the "in and out" motion may be given. It is well to caution, likewise, about this "in and out" motion, for if we consider the leverage which is had by a pair of forceps firmly seizing a tooth at its neck, it is a matter of surprise

that more teeth are not broken off in their socket. It is only by proceeding slowly and increasing the pressure when the tooth is observed to yield, that fracture may be avoided. For this tooth, as well as for all others, the head must be firmly grasped while in the head rest with the operator's left arm, so as to steady it while the effort is being made.

The lateral incisors. The same pair of forceps (Fig. 171.) may be used for the extraction of these teeth, except when they are very narrow or very small, when a pair of straight forceps with narrow beaks, like Fig. 172 should be used. These teeth are not difficult to

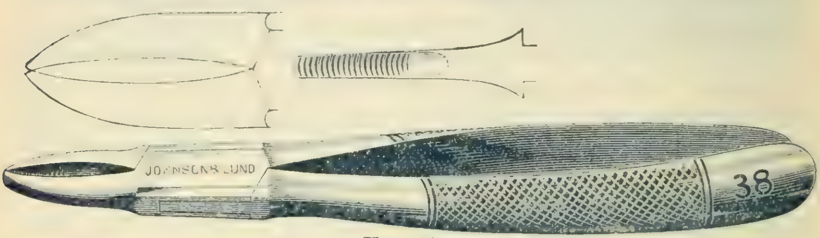


Fig. 172.

extract. They cannot be rotated to loosen them as their roots are considerably flattened, so that they must be loosened by the "in and out" motion. The same directions apply for the position of the operator and the seizure of the tooth and head of the patient as for the other cases. They should be seized high up on the neck of the tooth.

The central incisors. These teeth are also extracted with the straight forceps, Fig. 170. The roots being round, they may be rotated and are generally easily loosened and removed. No very special directions are needed for the extraction of these teeth other than what has already been given for the bicuspids, cuspids and laterals.

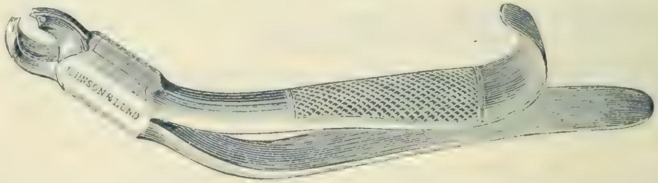


Fig. 173.

The lower left wisdom tooth. To extract this tooth, the position of the operator is on the right side of the patient. The roots of these teeth are generally fused into one, so that they are almost conical, but sometimes they are curved towards the ramus of the jaw. When

they grow in their upward position they do not offer much difficulty to extract, but in the position which they sometimes assume, viz., when the masticating surface abuts the distal surface of the second molar, it is often impossible to extract them without extracting the second molar also. To extract this tooth the forceps shown by Fig.

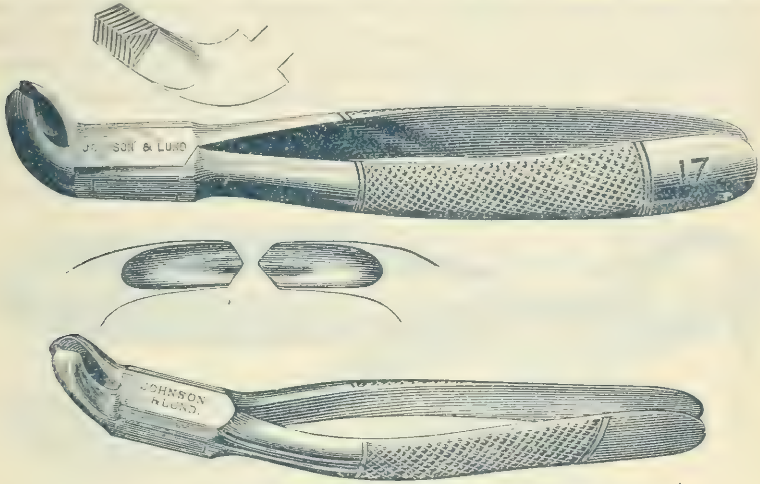


FIG. 174.

173 will be found most serviceable. The beaks are forced well down on the neck of the tooth. The thumb is placed between the handles near the joint so as to temper the pressure on the tooth, as it were, when the tooth is loosened by shaking it from side to side. Sometimes by throwing it towards the cheek will loosen it, while at other

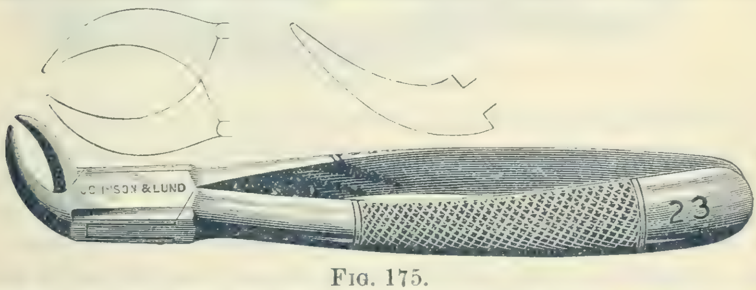
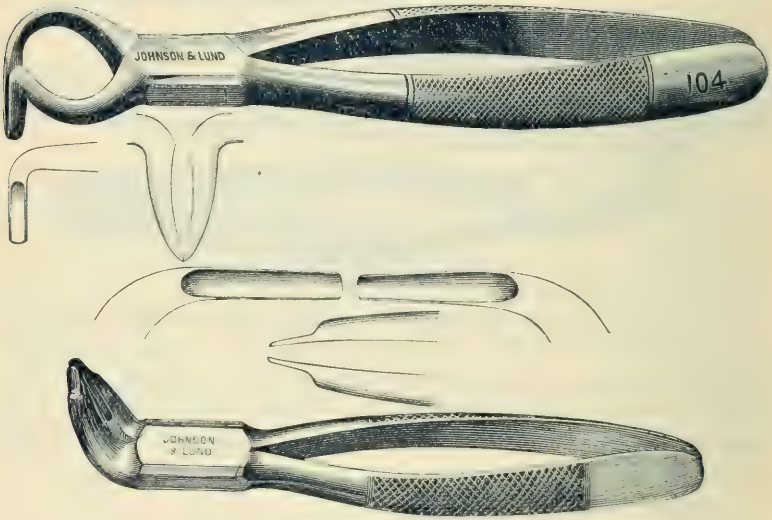


FIG. 175.

times it can be better displaced by throwing it towards the tongue. To extract *the lower right wisdom tooth*, the forceps Fig. 173 do not, in our hands, apply so well, although they are intended to extract the wisdom tooth on either side of the mouth. For the right lower wisdom tooth we prefer to stand in front of the patient and use a pair of

forceps with straight handles, such as are shown by Fig. 174, using the same efforts to loosen and remove this tooth as for the one on the left side. The same control cannot be had over the patient when the operator stands in front as when he stands on the right side, but the application of the forceps from that side is much more difficult.

The second lower molars. These teeth may be removed with the cow horn forceps, Fig. 175, sometimes with little effort. For that tooth, on the *left side*, the operator stands on the right side of the patient; for all the lower teeth he should stand on a stool so as to be a little above the patient. The forceps should be adjusted to the tooth so that the points of the horns be in the centre of the tooth both on its buccal and lingual surfaces. If thus well adjusted, often



FIGS. 176 and 177.

the simple closing of the handles of the forceps, with a slight shaking of the forceps, will cause this tooth to jump out of its socket. These forceps act like a double wedge, the inner curve of the horns acting on the tooth, at its bifurcation, and the outer curve acting on the alveolar process. Of course it will only jump out of its socket when the roots are well separated from each other. They are safe forceps to use when the person is not under the influence of an anæsthetic, *but a dangerous pair when the patient is unconscious*; for as they do not seize the tooth at all, it may happen that in thus slipping suddenly from their place, the teeth might fall into the fauces and cause strangulation. When the roots are not well separated, the points of

these forceps merely impinge into the slight groove formed by the fusion of the two roots, and the tooth is then not so readily removed as with a pair of forceps like Fig. 173. The extraction of *the second lower molar on the right side* is effected in the same way and with the same cow horn forceps, only that the operator stands in front of the patient. Should the roots be well separated this tooth will easily slip out of its socket by using the same force and directions as indicated for the other tooth, but if they are all fused together the forceps shown at Fig. 174 will be preferable. By a study of the shapes of the crowns of the teeth and the characteristics of teeth, the operator will soon learn whether they are easy or difficult to extract, or whether the roots are fused together or separated. By an

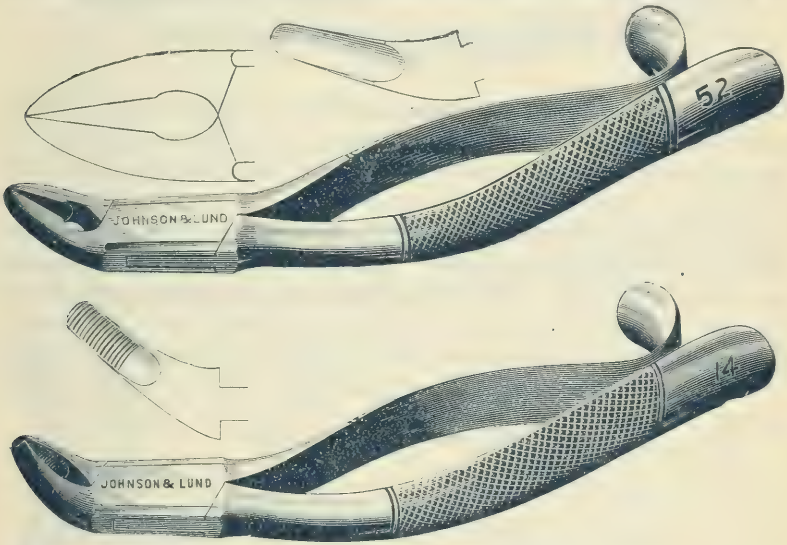


FIG. 178.

examination of the lower jaw, in the region of the second molar, it will frequently be found that the jaw at this point curves upward and outward, so as to present a plain. If the points of the horns of these forceps be not well adjusted to these teeth, and the crown be fractured by such oversight, the roots of these teeth will be the most difficult to extract. For, from the shape of the jaw at this point, it is sometimes impossible, even with alveolar nipping forceps, to cut through the process on the outside, in order to seize the root imbedded in the alveolus.

The first lower molars. The same directions apply for the extraction of these teeth as for the second molars; standing on the right

side for those on the left side of the mouth, and in front of the patient for those on the right side. Should the crowns of these teeth be so decayed as to prevent their seizure with the forceps, their roots may be removed with forceps like Fig. 176 or Fig. 177.

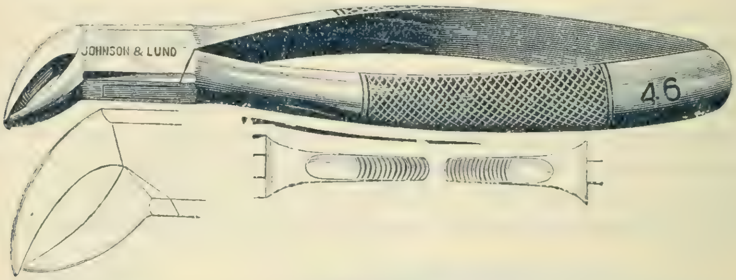


FIG. 179.

The left lower bicuspids. For these teeth, like all teeth on the left side, the operator should stand on the right side of the patient. A pair of forceps like either of these shown at Fig. 178, apply well. We prefer those whose beaks are not serated, No. 52, in preference to No. 14. These teeth are loosened in their sockets by seizing the tooth well down on the neck and using an " in and out " motion, together with an upward pulling. The greater force may be used towards the tongue. Frequently, from the roundness of the roots of these teeth, they admit of a slight rotation, which may be performed with these forceps, which assists in loosening them or breaking up the attachments.

FIG. 180.

The lower right bicuspids may be extracted with forceps like Fig. 179, by standing slightly in front of the patient, slightly to the right side, and using the same character of force as the other to dislodge the tooth. By throwing the chair far back and standing behind the

patient on the right side, these teeth may be seized and removed with a pair of forceps like Fig. 180.

The lower left cuspids are ordinarily quite difficult teeth to extract. The roots are long and deeply imbedded in the bone. The forceps used for the extraction of the left lower bicuspids may be used for these teeth; but particular care should be taken to seize them as near the alveolar margin as possible. A rotary motion combined with the "in and out" as also with the upward pulling, will generally dislodge them, but care must be used to avoid fracturing the crown from the root.

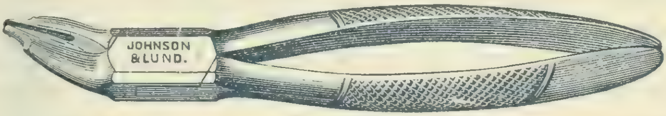


FIG. 181.

For the lower right cuspids the same forceps as those recommended for the lower right bicuspids may be used, and the same character of force as directed for their fellows of the left side, should be observed for these teeth.

For the lower incisors a pair of narrow beak forceps like those shown at Fig. 181, will answer for the removal of any of these four lower teeth, whether for the right or left side. The operator should

FIG. 182.

FIG. 183.

FIG. 185.

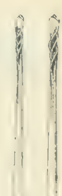


FIG. 185.

stand at the back of and over the patient, slightly to the right, the back of the chair being thrown back or lowered, and the tooth seized well on the neck. These teeth are ordinarily easily removed with the in and out motion, or a slight twisting. The beaks of the forceps should be quite narrow. When these teeth are crowded—as they frequently are—and one of them extracted to correct an irregularity, which is frequently done, it is well to place a piece of separating rubber on each side of the tooth that is to be removed, for a day or

two before its extraction, this will not only increase the space and permit a better application of the forceps, but will also slightly loosen the tooth and admit of its easier removal. Not only this, but by the greater space being gained by the action of the rubber, there will be much less liability of fracturing a piece of the enamel from either of the adjacent teeth, which sometimes will occur from the lack of space in the application of the forceps.

THE EXTRACTION OF ROOTS.

Ordinarily roots that have remained in the mouth for a long time become so loose that they can be removed with very little effort to the operator, and very little pain to the patient. Roots like these have little or no socket and lie loosely on the gum; they may be pushed out towards the tongue with stump extractors like Fig. 182,

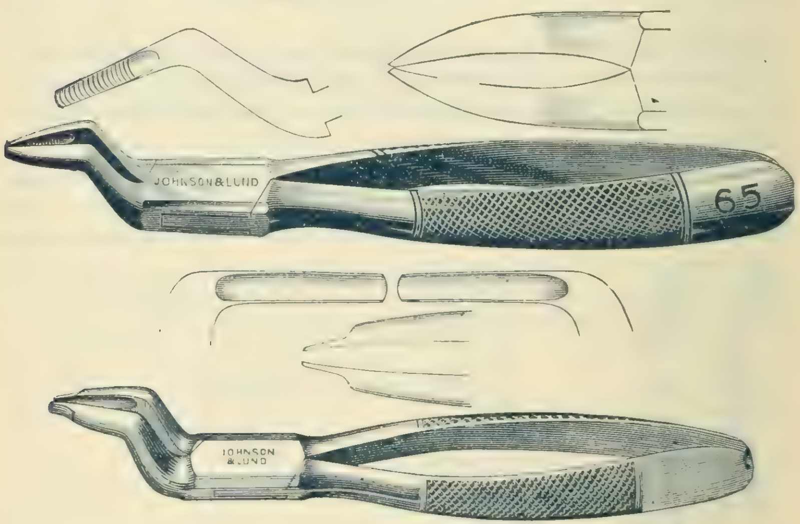


FIG. 184.

or pulled outwardly with a stump extractor like Fig. 183. Sometimes, however, these roots remain firmly embedded and give considerable pain and effort to extract. If not so much decayed as to permit their seizure with the forceps, they can be removed with these instruments. Ordinarily, a twisting or rotary motion will effect the removal of most roots. For those situated far back in the mouth, like the roots of the third molars either right or left in the upper jaw, the forceps Fig. 184 will be found of service. For those further forward in the mouth, such forceps as are shown at Fig. 169 will apply

better. For roots of the same character in the lower jaw the forceps shown at Fig. 176 will generally apply, especially should such root or roots be behind a molar or bicuspid, the opening in the forceps permitting a better view of what is being done. For other roots in the lower jaw the forceps Fig. 169 will generally apply.

Fig. 186.

When the edges of roots are so fragile or decayed as to chip away at each attempt to seize them with the forceps, other means must be used to extract them. For the roots of the upper central incisors and cuspids, as also those of the lower cuspids and bicuspids, the nerve canals of these are prepared by reaming them out with drills and conical burs, such as are shown by Fig. 185. This being done, the conical screw shown by Fig. 186 is inserted into the depressions thus prepared, when it cuts its way into the root, thereby gaining a firm hold, whereby these roots may be extracted, generally by a twisting motion. But the buccal roots of upper molars, and the roots of the bicuspids and lateral incisors are too small for the use of such a conical screw as is shown by Fig. 186. But the same means are used for their dislodgment. We have extracted these by means of a small wood screw such as is shown by Fig. 187, when every other attempt made failed, and this with much less pain to the patient.


Fig. 187.

If a root is found to be firmly fixed in its socket, it is well, before making any effort to remove it, to find out the direction in which it lies, so that it may be *drawn in this direction.* It would be the infliction of a needless amount of pain as well as a futile attempt to proceed without this knowledge. For this purpose cleanse out the nerve canal and insert into it a fine probe; this will give the direction in which the root lies, as shown by Fig. 188, when the root may be readily extracted by pulling in the direction of the arrow marked A. If, without this precaution, the attempt be made to remove the root by pulling in the direction of the arrow B, the attempt will not only result in failure but in the infliction of considerable pain.

TEETH DIFFICULT TO EXTRACT.

It is well for an operator to be able to determine whether the tooth he is about to extract will be easy or difficult of removal by a study of the form of the crown, or the character of the tissues of which the teeth are made.

Of the latter, teeth of a dense yellowish shade, having a vitreous semi-transparent cast are difficult to extract. They are firmly embedded in their sockets, which are almost as dense and unyielding as

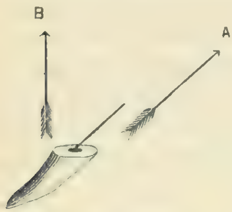


FIG. 188.

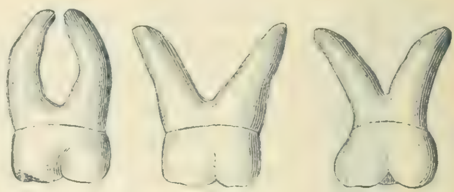


FIG. 189.

the teeth themselves. Such teeth, too, are brittle, and need to be removed with care for fear of fracture. Negro men, ordinarily, have very large teeth and teeth difficult of removal. Men whose occupation keep them much in the open air, and whose work is hard, requiring the exercise of considerable muscular effort, are possessed of fine organisms, and the teeth of such men are ordinarily difficult to extract. Teeth whose crowns are *very narrow at the neck*, as well as those whose crowns are *wide at the neck*, are difficult to extract. These configurations generally indicating a considerable divergence

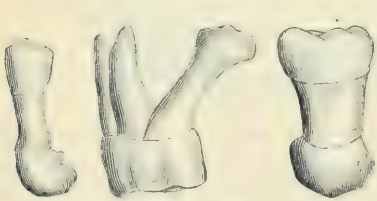


FIG. 190.

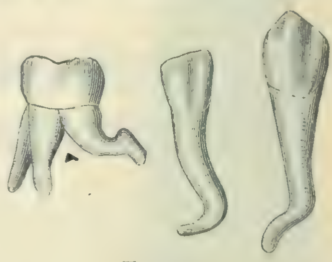


FIG. 191.

of the roots or roots causing a large septum of bone, as Fig. 189 indicates. Teeth affected with exostosis, where the deposit has grown to considerable proportions, are very difficult, sometimes impossible to extract, unless the constriction in the socket may be burred or cut away, so as to permit the escape of the exostosed root, as shown by Fig. 190. Teeth with a sudden abrupt crook in the root, as frequently

occurs in the lateral incisors, sometimes in the upper cuspids and sometimes on one of the roots of the molars, as shown by Fig. 191, are very difficult to extract. Of course many of these latter cases are abnormal conditions which cannot be foreseen, and must therefore be taken as they come. The breaking of the end of a root such as we have indicated is an accident that may happen to any one, however skillful he may be; it is only the fracture of the crown leaving the whole of the roots embedded that may be termed unskilled work.

In the same way that we recognize certain difficulties in the extraction of teeth by peculiar characteristics of the tooth, or of form, or occupation, so do other characteristics point to general facility in the operation. It goes without saying that teeth that are excessively loose are easily extracted, as for instance when such are so coated with a deposit of tartar that the peridental membrane is entirely removed from the root, leaving it without adhesion in the socket. Teeth that are soft and chalky in their nature or highly vascular, are ordinarily easy of removal. Teeth of anæmic persons, cachectic or scrofulous are so likewise; molars that are multi-cuspid are often easy to remove.

[TO BE CONTINUED.]

NINTH PAPER.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Phila., Pa.

Q. To what disease are the teeth most liable?

A. To Caries.

Q. What do you understand by caries?

A. It is a chemical decomposition of the mineral elements of the tooth, involving also the animal or organized constituents.

Q. Is decay or caries the exception or the rule?

A. In the majority of cases, in the present generation, it is the rule.

Q. Is it of such frequent occurrence?

A. It is, and often so insidious as to involve many teeth into almost irreparable ruin before it is suspected by the patient.

Q. How do caries first indicate its presence?

A. By an opaque spot; a whitish chalky appearance beneath the enamel, or a dark brown, bluish, or black indication.

Q. Does decay begin from within and proceed outwardly or the reverse?

A. It always begins outwardly in the dentine beneath the enamel.

Q. How can it do this, since the crown of the tooth is covered with enamel?

A. Generally through some crack, fissure, abrasion, sulcus or some otherwise imperfect points in the enamel.

Q. What ensues after decay has made considerable progress in its disorganization of the dentine?

A. The framework or shell of enamel breaks away in the pressure brought against it in the act of mastication.

Q. Does this always happen?

A. No. If the enamel be very dense. a large part of the dentine may be eaten away without the enamel crushing away. It is only when the teeth are of a highly organized character and this characteristic favored by a wet, ropy, stringy condition of the saliva, that the enamel does not seem to be able to withstand the pressure of mastication without fracture.

Q. Are all parts of the crown liable to decay?

A. Yes; but some surfaces more so than others.

Q. Give me some examples of greater and lesser liability to caries?

A. The masticating surfaces of the molars and bicuspids, and the proximate surfaces of all the teeth, are more liable to attack than the buccal, labial or palatal surfaces.

Q. Why should not decay attack the enamel with as much facility as the dentine?

A. Because the enamel is so much harder and is not as easily acted on by those causes which produce caries.

Q. Are there any times when the enamel is attacked and the dentine not?

A. In the disease called Erosion, the enamel seems to melt away while the subjacent dentine resists, to a certain extent, the causes producing the disease.

Q. Has decay in the teeth any color?

A. Yes; there are several varieties, white, light brown, brown and black decay.

Q. Is there anything noticeable in the different kind of caries?

A. The lighter the character the more rapid the inroad. Black decay progresses very slowly and is noticeable generally in teeth of a yellowish, dense, flinty character.

Q. Is any reason assigned for the different color of decay?

A. It is thought to be due to the modification of the agents which originally produced the caries, as well as to the character of the teeth acted on by these agents.

Q. What is noticed when the decay is removed from a carious tooth?

A. Decay seems to proceed in layers, and each layer is of a lighter color than the one previously removed.

Q. What has been noticed by Mr. John Tomes as a difference between decayed dentine and normal dentine?

A. He noticed that the dentinal tubuli were less distinct near the margin of the carious structure than it was in normal tissue in proximity with the pulp-chamber, and that there seemed to be a consolidation of these tubules, that he regarded as an effort on the part of nature to resist the encroachments of decay, and thus set up a boundary between the diseased and healthy tissues.

Q. How is decay classified?

A. By *deep-seated*, *superficial*, *external*, *internal* and *simple*.

Q. How may these classifications be regarded?

A. Only as different stages of the same disease.

Q. What do you understand by complicated decay?

A. A decay which has penetrated into the tooth substance to such an extent as to bring about the death of the pulp from exposure.

Q. Is decay confined only to the crown of the tooth?

A. Generally this is the case; but sometimes the root will decay also, after the crown has all melted away. Decay, however, never begins in the root. It sometimes begins at the neck of the tooth above the enamel.

Q. Does the loss of the crown of the tooth necessarily involve the loss of the root?

A. It does not. The root may remain for years without farther decay. It is true that the exposed surface near the gum will be affected by decay, and this will continue, in some cases, until nearly the whole root is consumed, but by simple treatment such roots may be preserved almost indefinitely.

Q. Do some teeth decay more readily than others?

A. Yes.

Q. Which are more susceptible to decay?

A. Teeth that are multi-cuspid. Irregular in shape and position. Great convolutions of the enamel. White, vascular or highly organized teeth, decay oftener and more readily than teeth which are regular in shape and position, dense in structure and yellowish in appearance.

Q. How do you account for the difference in the characteristics of teeth?

A. By the general health and the perfect performance of all of nature's functions at the time of the development of the teeth.

Q. But if a child who is developing his teeth should have some disease of the foot should this affect the teeth in his head?

A. Because there exists in all the parts of the living body the most intimate relations, all of which correspond with each other, and carry on a reciprocal intercourse of sensation and affection. Hence, if there be a morbid action in one part, other parts sympathize with it, rallying as if sensible of the mutual dependence existing between them, and exciting all their energies to rescue their neighbor, whether remote or near, from the power of disease.

Q. But suppose a child be weak and delicate during the period of dental development, and by proper care or influences should overcome disease and become healthy, strong and vigorous, would his teeth partake of his changed condition?

A. To a certain extent yes, but the capillaries and blood vessels form a large part of every organ, especially in the incipient stage; these structures, once formed, pass beyond the reach of the capillaries, except the layer of dentine in contact with the pulp, which is the progenitor of the tooth. Hence the pulp may deposit new and healthy bone according to the changed condition of the individual, as a barrier against caries, but as this part of the tooth is not the part affected by deleterious action, the change of condition will only exert a relative influence.

Q. How are teeth formed?

A. Generally in pairs.

Q. Why do you say *generally in pairs?*

A. Because we sometimes find one tooth erupting long before its fellow, and if they were formed and advanced regularly they would erupt at or about the same time.

Q. What causes this irregularity of eruption?

A. The premature extraction of a temporary tooth may so affect or injure the germ of its permanent successor as to destroy this or cause its retardation.

Q. Does the development of teeth in pairs point to any indication for their better preservation by the dentist?

A. It does; for we find that if a tooth is defective at a certain point on one side of the mouth, its fellow on the other side of the mouth is almost sure to have a similar defect, whereby the dentist can stop extensive decay by prompt action.

Q. If an individual should possess good teeth will a changed condition of health impair them?

A. It will. Fevers, or any serious constitutional disturbance will greatly affect them. The excessive administration of mercury and other strong medicines also exert a deleterious influence upon them.

Q. Is it supposed that these strong medicines act directly on the teeth?

A. No; but the influence of these medicines may so vitiate the secretions of the mouth that they may indirectly tend to their decay, by changing the constitutional condition of the individual.

Q. How is this proved or accounted for?

A. It has been noticed that persons wearing artificial teeth made of bone or ivory, that these decay more rapidly after the profuse administration of medicine, or during the existence of any disease that tends to vitiate the secretions of the mouth, than at other times.

Q. Is decay of the teeth limited to any time of life?

A. It seems to be. It is most rampant between the tenth and twentieth years, almost ceases about the fortieth or forty-fifth year. That is to say, if a tooth has escaped decay up to the fortieth year of the individual, it very rarely *begins to decay* at that age.

Q. Is decay of the teeth hereditary?

A. To a certain extent it is, as we find children whose teeth partake of the poorness or superiority of one parent or the other. Nevertheless, the good influences of pure air, exercise, a life of active pursuits, passed greatly out-doors away from the city, tends in a great way to overcome hereditary influences.

Q. To what cause is attributed the excessive decay noticed in the teeth of Americans?

A. It is thought to be due to the changing of the constituents of the food we most largely use. To the mode of life, to the bolting—not proper chewing—of food. To the indoor life pursued by most of our people—principally females. To the lack of vigorous, outdoor exercise, and such like causes.

Q. How many teeth is it estimated are lost yearly by decay?

A. It is computed, despite the advances made in dentistry in this country, that fully 20,000,000 teeth are lost by decay.

Q. How are the two causes of decay termed?

A. Predisposing and Exciting.

Q. What are the predisposing causes?

A. A defective constitution, hereditary influences, or any condition which may interfere with the proper elemination and application of

the food or other materials necessary for the formation of perfect teeth. Fevers of all kinds or eruptive diseases. These weaken the organism and are powerful predisposing causes of decay.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED BY THEODORE F. CHUPEIN, D. D. S.

INCIDENTS OF OFFICE PRACTICE.

Dr. W. H. Trueman reported a case of broken bridge work which he had repaired *in the mouth* with soft solder. Having scraped, brightened and cleaned the parts thoroughly, he protected the lips and gums with a wet napkin, and with tne assistance of his office boy, who held and managed a small gas jet of English manufacture (designed for waxing up rubber sets), he heated a small soldering iron close to the patient's mouth, and was enabled to flow the solder sufficiently smooth to unite the broken bridge and tooth connected with it, and make a quite firm and strong job. This was done with comparatively little discomfort to the patient.

Dr. Roberts had been able to repair pieces of broken bridge work with amalgam.

Dr. Chupein reported a case in his practice which had given him much solicitude and trouble. The tooth—an upper right molar—had been contoured with gold by him quite extensively, and the tooth had remained perfectly quiet and comfortable for some three or four years, when, without any assignable cause, abscess came on and gave all the torture incident thereto. To evacuate the pus a large hole was drilled through the filling into the nerve chamber, but this did not relieve the congested condition. He had finally drilled through the palatal root with a very minute drill and had endeavored thus to evacuate the pus. When quiet was restored he had treated the disease, but up to now (June 1891), although several efforts to this end had been made, he had not been able to conquer the disease, the patient complaining of very severe pain when any attempt at treatment was made, particularly was the pain most severe when he had forced per oxide of hydrogen in the abscess (a blind abscess) with a Dunn's abscess syringe. After a time the pain of treatment would subside, and the tooth would remain comfortable, but at each attempt at treatment there would be a recurrence of the same severe pain. The patient had been able to use the teeth with comfort by filling the hole loosely with cotton to prevent the ingress of food, which was removed after each meal and fresh floss replaced.

Dr. Roop had had almost similar cases, which seemed to refuse

treatment. He proceeded by filling the end of the root loosely with cotton steeped with carbolic acid and iodoform, and on this he placed a pellet steeped in sandarac varnish. If this was tolerated, at the next sitting he introduced another pellet of cotton steeped in sandarac varnish, and he continued thus until the whole root was filled, after which, if the tooth gave no trouble, he filled the crown.

Dr. Trueman, in such cases as related by Dr. Chupein, relied on the vent hole.

Dr. Roop related a case of necrosed root, which he had amputated from the crown of an upper molar, leaving the crown intact with only the two buccal roots. He did not know if the operation was original with him?

Dr. Chupein had heard of a *lower molar* being cut in half by Dr. T. C. Stalwajen, so as to make use of one root and so much of the crown over it as was good, but he had not heard of an operation, as related by Dr. Roop, where only the root was amputated without disturbing the crown.

Dr. W. H. Trueman exhibited a little device for the removal of crowns which were set in the roots with gutta percha. It was merely a small vial with a slot in the cork, through which passed a piece of grocer's cotton cord, forming a wick. The cord was moistened with alcohol and set on fire. A minute blaze was the result, which was held for a few moments next the crown. The gutta percha was thus quickly softened, more quickly and effectually than by the application of a heated instrument to the tooth, as is usually the plan adopted, and with no discomfort to the patient. The cut represents the appliance. The idea was suggested by Dr. Keyser.

At a meeting of the above Society, held on the occasion of its annual meeting, Oct. 13, the following officers were elected to serve for the ensuing year:

President—Howard E. Roberts.

Vice-President—Charles F. Bonsall.

Corresponding and Recording Secretary and Reporter—Theodore F. Chupein.

Treasurer—W. H. Trueman.

DR. J. W. CLOWES' IMPROVEMENTS IN DENTISTRY.

Our present engravings illustrate a notable improvement in the art of dentistry, of which Dr. J. W. Clowes, of 667 Fifth Avenue, New York City, is the author.

The object of the invention is to provide a simple and effective means by which missing teeth may be artificially restored, and broken, loose and dilapidated natural teeth may be preserved from decay and helped to become mutually supporting to each other.

The invention consists in fillings inserted in cavities in approximate faces of contiguous teeth, said fillings resting directly upon the gums, and being formed of a single body of material connecting the teeth so that they mutually support each other. It also consists in fillings of plastic material in cavities in appropriate faces of the teeth and extending between and across the teeth and down upon and closely contacting with the gums.

The plastic material which the author has so far found to be best adapted for the purpose of his invention is the ordinary dental amalgam; but he does not limit himself to this material, as any other plastic material may be used which sufficiently hardens and solidifies after it is put in place.

FIG. 1.

Our engravings are taken from a case that recently occurred in Dr. Clowes' practice. Fig. 1 shows the condition of the patient's upper teeth prior to treatment.

It will be noticed several of the most important teeth are gone, and the task Dr. Clowes sets for himself, in such cases, is to restore to the gums the missing dentures, the use of plates being avoided.

Cavities in the contiguous teeth, shown at the left in Fig. 2, are excavated and prepared for receiving fillings in the usual way with undercuts and anchorages to insure a firm hold of the filling in the teeth, and the plastic material, such as amalgam, is inserted in the teeth, so as to fill the cavities and the space between the teeth, which amalgam is also moulded upon the surface of the gum between the teeth, so as to press firmly thereon between the teeth, and the plastic material

of the filling is shaped to conform to the natural contour of the teeth, but without actual division of the filling material between the teeth, the filling when completed appearing as shown in dotted lines at the left of Fig. 2. When the material of the filling solidifies and hardens,

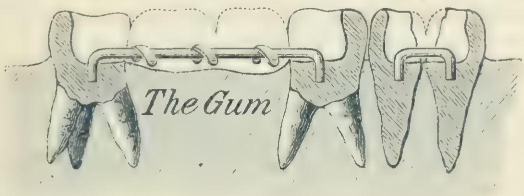


FIG. 2.

the teeth will be rigidly connected and locked together, so that they cannot spread apart, and the filling will be in close contact with the gums and will completely close the space between the teeth, so that food cannot enter between the teeth or between the filling and the gum. By this method of locking the teeth together, if before treatment one of the teeth should be loose, as is frequently the case, it becomes locked to the sound tooth and is held firmly in its proper place.

FIG. 3.

When the natural teeth are absent between two decayed teeth, having cavities in adjacent places, as shown at the right in Fig. 2, the said cavities are prepared for receiving plastic fillings in the usual way and the fillings are inserted, and the body of plastic mate-

rial of which the fillings are formed is extended in one body across the space between the two teeth, and moulded and firmly pressed upon the face of the gum, connecting the teeth, as shown in Fig. 2, and forming a rigid body of material, which, in addition to this use as a support and connection for the teeth, may be used for the purpose of mastication, and this material may be moulded or carved in imitation of natural teeth, as shown by the dotted lines in Fig. 2. This body of material is firmly locked to the teeth, and forms, not a bridge, but a causeway between the said teeth.

In forming the fillings care is taken to mould them firmly upon the gums, so has to perform a perfect contact therewith. The gum is thus made partly to support and to carry the prolongations of the fillings of the teeth, while the close contact of the teeth with the gum and the naturally elastic or expansive quality of the gum operate to exclude and expel particles of food or deleterious matter from between the gums and the plastic fillings that are kept in contact with the gums.

FIG. 4.

In the example of three adjoining decayed teeth, which it is desired to fill and lock firmly together, the cavities are excavated in the form of grooves extending through the teeth and the cavities are prepared in the usual manner, and the plastic filling is inserted, so as to close the cavities and conform to the contour of the natural teeth, and the material of the filling is, as before described, moulded firmly upon the gum between the teeth and is made to close the space between the teeth and form a body of the filling material which extends continuously through the teeth and along and upon the gum between the teeth, thus locking the teeth firmly together. For the further

strengthening of the teeth and to further assist in locking them together, a hooked bar, similar to that already described, is inserted in the outer teeth of the series, and the filling is pressed upon and around the bar as in the other case, which thus becomes inclosed within the filling and adds strength thereto, as before described.

In the case of absent front teeth, grooves are made in the back of the adjacent natural teeth, and a bar is inserted, extending from tooth to tooth. Artificial teeth, grooved at the back, are fitted to the bar, and the grooves are closed with the plastic filling, which thus incloses the bar and locks both the natural and the artificial teeth together in the firmest manner. This is illustrated in Fig. 3, which is an inverted interior view of the patient's mouth, after the entire work has been completed, the dark, shaded portions representing the improved fillings.

Fig. 4 illustrates the external appearance of the patient's teeth after treatment by the Clowes' method. The contrast between Fig. 1, which shows the original condition of the patient's dentures, and Fig. 4, showing the completed work, is very striking.

In discovering the peculiar use and application of amalgam, as herein set forth, a grand stride has been made in dental science.

That any foreign substance could be pressed and immovably fixed without irritation upon so delicate a tissue as the human gum has heretofore been considered impossible and unworthy of professional consideration; but thorough and long-continued tests have proved the practice to be highly beneficial and preservative.—*Scientific American.*

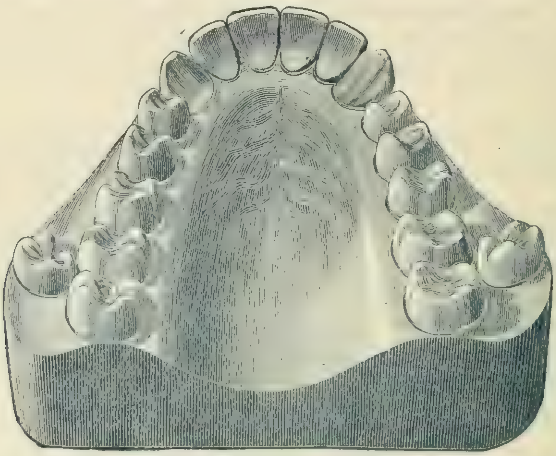
CORRESPONDENCE.

VICTORIA, August 19th, '91.

DEAR DOCTOR CHUPEIN :—The following case may be of some interest to the dental profession at large, which came under my hands a few weeks ago.

A gentleman, forty one years of age, applied to me for treatment. Finding the left upper molar tooth badly decayed, I advised extracting, (we may call it second wisdom tooth); but at a second glance, before putting the forceps on, I counted four molars on each side in the upper jaw. I then asked the gentleman when he cut the two teeth in situation on the outside of the two last molars, and was told

six years ago, he then being thirty-five years of age. Before extracting the tooth, I took an impression of his mouth, which was a very



difficult one ; but I got it very perfect. Above is a rough sketch of the cast.

I remain, Yours respectfully,
S. M. Hartman, L. D. S.

THE PRACTICAL PLACE.

Copper Amalgam.

Dr. Perry : I want to express a strong regret for ever having used copper amalgam. I think it will not only blacken the teeth, but blacken any man's reputation, and I think the sooner that is known and appreciated in the profession, the better it will be. Unfortunately, it is not a trait of human nature to profit by the experience of others. We like to learn for ourselves. I am commencing now to do over many of these fillings, which I put in two years ago I have been doing them over for sometime past. It is unreliable.

I feel impelled to make this severe statement in reference to copper amalgam because only recently a man long in practice, a member of this society, told me had just commenced its use, and, knowing one must wait for two or three years to really know its effects, I thought it my duty to warn others as I warned him. It causes, first, the discoloration of all dead substances of the tooth ; in the next place, it wears away mechanically, evidently on the surface, and it wastes away, on proximal surfaces, in a manner that suggests chemical solution. When it becomes necessary to remove such a filling, there is a

more sensitive condition to contend with than when the cavity was first filled. When used for the purposes of contouring teeth, it takes but a year, or two years at the most, to allow so much waste from the fillings that food easily passes in between them, and the fillings have to be replaced. It is nasty stuff, anyway.

Dr. Howe: I am very glad that Dr. Perry has spoken on this subject. I have not used copper amalgam for over a year, and during that time I have spoken to several of my friends, expressing an unfavorable opinion of it. They have either replied, "You use it too stiff," or else, "You use it with too much mercury in it," or "You do not mix it right." I have had some results which coincided with the favorable reports that have been made of it, but they were so few, as compared with the relatively large number of unfavorable results, that I do not consider it at all reliable. Its antiseptic properties have been dwelt on very greatly, and what has been said has, no doubt, given many dentists the confidence they have in it. I suppose it has been proven to be a permanent antiseptic material, but I find that teeth will decay right alongside of fillings made with it. Zinc-phosphate fillings would seem to be more reliable, when they are used with judgment, and the limitations of the material are recognized, than copper amalgam.—*N. Y. Odontological Society.*

We are not as enthusiastic for the use of copper amalgam now as we were at the time of its introduction, nor do we employ it nearly so much as we did formerly. Yet we cannot condemn it unequivocally, as we believe that it has its uses in dentistry both *in* and *out* of the mouth. That it has not a nice appearance in the month, that it cups, and that it blackens tooth substance, we are willing to concede. Yet for desperate cases, where it is difficult to fill upper or lower second or third molars, on their distal surfaces, or indeed in any inaccessible locality with any of the ordinary alloys, we hold that copper amalgam is useful. That decay recurs where it has been used we have not observed in any case where we have made use of it, and even in cases where we have noticed extensive cupping (or wearing) we have not noticed any recurrence of decay. And every one who has used it, will admit, that there is an entire absence of that bulging or protrusion in cavities where it has been used, which cannot be admitted in the use of ordinary amalgams—which is a suggestion of filth or decay.—[Ed.

What is Money?—The London *Tidbits* lately offered a prize for the best definition of money. The prize was awarded to Henry E.

Baggs, of Sheffield, who defined it thus : "An article which may be used as a universal passport to everywhere except heaven, and as a universal provider of everything except happiness."

Copying Models.

In copying a model in sand or marble dust, when it is difficult to remove it and leave a perfect impression on account of undercuts or any other reason, Dr. A. W. Freeman recommends covering the model with heavy tin foil. The model can then readily be withdrawn, leaving the foil in the sand or marble dust, and thus enabling one to secure a good copy.—*The Dental Review.* We have done this long ago, often, and know it to be a good plan.—[Ed.

To Remove Iodoform Odor from Hands.—For the removal of the iodoform odor from the hands and utensils, Bienert recommends washing once with linseed oil and water. The odor is said to disappear with surprising quickness.—*Pharm. Centralhalle.—Druggists' Bulletin.*

A plan that never fails to give a natural bite in taking articulations for artificial dentures : Have the patient open his mouth, and before closing tell him to place the tongue on the roof of the mouth and keep it there while closing. Try it yourself, it can not fail. —*W. Goodfellow, Sussex, N. B., Canada.*

PRACTICAL ELECTRO-PLATING.

From the *Jewelers' Circular.*

The following solution for gilding to be used with a common battery, is sufficient for a 4 gallon jar :

GOLD SOLUTION.

Chloride of gold.............................. 4 ozs
Cyanine of potassium........................12 ozs
Concentrated ammonia, sufficient.

Dissolve the chloride in sufficient pure boiling water, then by the use of a very small quantity of concentrated ammonia, precipitate the gold from the solution. Let the matter stand until settled ; pour off the water ; repeat the operation two or three times, taking the care not to wash out the gold. Now dissolve the cyanide in hot

water; this must be done in a vessel which is to hold the solution; pour in the gold and boil.

NICKEL SOLUTION.

To 1 gallon of water add from 1 to 2 pounds of nickel salts; boil and stir until cold.

SILVER SOLUTION.

Chloride of silver......10 ozs
Carbonate of sodium......12 ozs
Cyanide of potassium, enough to take up the silver.

Make the same as for gold plating.

BRASS SOLUTION.

Sulphate of copper...... 3 lbs. 6 ozs
Sulphate of zinc...... 3 lbs. 6 ozs
Carbonate of sodium......15 lbs.
Bisulphate of sodium...... 5 lbs.
Cyanide of potassium...... 6 lbs.

Dissolve the sulphates of copper and zinc in hot water; dissolve 10 pounds of the carbonate of sodium in hot water, and add to the first. Let the mixture settle, then pour off the water, and repeat two or three times. Now dissolve the remaining 5 pounds of carbonate and the bisulphate of sodium, and add; then dissolve the cyanide of potassium in hot water; add the other substances, and let the mixture set for two or three days before use.

COPPER SOLUTION.

Sulphate of copper......10 lbs.
Carbonate of sodium......22 lbs. 2 ozs
Bisulphite of sodium...... 7 lbs. 6 ozs
Cyanide of potassium...... 5 lbs.

Dissolve the sulphate of copper, and 17 pounds of the carbonate of sodium; add together, wash, and repeat as in the brass solution; now dissolve the remaining carbonate and bisulphite of sodium; add; dissolve the cyanide of potassium and add. Let the mixture stand two or three days, then use.

The above solutions may all be used with the aid of a dynamo or common Bunsen or Smee cells. The solutions may be placed in jars or tanks, over which two brass rods are stretched, connecting with the poles of the battery. An anode corresponding to the solution in the jar must be attached by means of a copper wire to the rod connected with the positive pole, while the cathode or article to be plated should be attached to the negative pole.

BRASS DIPS.

Equal parts of sulphuric and nitric acid, to which a small quantity of muriatic acid is added, must be prepared. Cleanse as if to plate,

that is, dip into hot potash solution, then in to cold water before placing in the acid, where it must remain but for an instant; then at once into and shaken about in cold water, thoroughly washing off the acid; then into hot water and sawdust.

To secure the perfect cleanliness necessary to the article to be plated, there must be placed near at hand, solutions of boiling hot carbonate of potassium, plenty of perfectly clean hot and cold water and a solution of cyanide of potassium.

BRONZE.

This result is obtained by plating the article in copper or brass, and dip it in a hot solution of sulphide of potassium.

OXIDIZED SILVER.

Plate the article in silver, and dip it into a solution of either of the following: bichromate of potassium, bisulphate of sodium, or chromic acid.

OPERATION.

First place the article which is attached to a copper wire, for a moment in the hot potash to remove all vegetable substance, then quickly plunge it into cold water, which should be running, then into cyanide; once more into cold water. The article is now chemically clean, and ready to be placed in the plating solution. Judgment must now govern the plater, when to remove the article and plunge into clear cold water, and then immediately into clean hot water, and last into boxwood sawdust, where it must be shaken until dry.

If the article should now be dim from an excess of gold, a small wire scratch-brush should be placed in the lathe, and the article gently brushed, all the time being kept moist by frequent dipping in a solution of soap and water. Silver may be brushed in the same way, but it is generally burnished. Nickel, copper and brass are buffed.

A GOOD COUGH MIXTURE.

℞. Acidi hydrocyanici dil............
Chloroformi purif, aa...... ....xxxvjii minims
Tincture hyoscyami................
Syrupi tolutani . ...
Aquæ camphoræ, aa..:.............vj fluid drachms
Mucilagonis acaciæ................ v fluid drachms

M Sig. One tablespoonful every two to four hours. For children in proportionate doses.

BOOK NOTICES.

Dental Medicine.—A manual of Dental Materia Medica and Therapeutics. By Ferdinand I. S. Gorgas, A. M., M. D., D. D. L., Editor of "Harris' Principles and Practice of Dentistry," "Harris' Dictionary of Medical Terminology and Dental Surgery," Professor of the Principles of Dental Surgery, etc., in the University of Maryland. Baltimore. Fourth edition, revised and enlarged. Philadelphia, P. Blakiston, Son & Co., No. 1012 Walnut street. 1891.

It is but little over a year since the third edition of this valuable work was placed on the market; but such has been the demand for it and such its recognized merits that the author has made important additions, and enlarged it to meet the requirements of the progress in the matters of which it treats. It is almost impossible in a work of the kind to prevent inaccuracies, but these are comparatively few. It is superfluous to say aught but in praise of a work that should be in the hands of every dental student and practitioner.—[Ed.

3000 Questions on Medical Subjects.—Arranged for self-examination, with the proper references to standard works, in which the correct replies will be found. Philadelphia, P. Blakiston, Son & Co., 1012 Walnut St. 1891.

This little work, so important to the medical student, is generously given, *free* of all charge by the publishers, with the exception of a charge of *ten cents* to pay for mailing and postage. It is endorsed by the highest medical authorities, and we are sure will be most acceptable to the student The answers to the questions are given in standard text books, a plan most admirable, for when a little trouble is given to obtain information, it is more likely to be retained than when given as in the ordinary Quiz Compend.—[Ed.

OBITUARY.

We are called upon to announce the death of a most worthy and estimable ex-member of our profession. Dr. David Roberts began the study of Dentistry as a student of Dr. Jacob Gilliams about 1849. Shortly thereafter he united with the Pennsylvania Association of Dental Surgeons, taking an active part in its proceedings and for some time serving as its Secretary. Upon the organization of the Philadelphia Dental College in 1852, he entered as a student, attended lectures two sessions, and graduated at the second annual commencement, February 28th, 1854. He early took a place in the front rank as a skillful operator, and by close attention to his calling, his gentleness, his exquisite neatness in person and in his surroundings, and his engaging and pleasant manners, soon gained him a

lucrative practice. In 1878 he retired from active practice, continuing, however, his interest in the profession by serving as a trustee and secretary of the Pennsylvania College of Dental Surgery, the immediate successor of the college from which he graduated. Dr. David Roberts, in his public, professional and private life, presents an example well worthy of the highest respect, and one that may be safely followed. With no greater advantages than thousands enjoy, he succeeded by his own energy and perseverance by uniting to an unusual degree, professional and business success, so that he was able to spend the closing years of his life in ease and comfort, and he has left us an example of what an ideal successful life should be.

Dr. Charles A. Kingsbury, who died at his residence, No. 1119 Walnut street, was in the active practice of his profession almost up to the time of his death. Before the inauguration of the Odentographic Society he was a member of and took an active part in the transactions of the Pennsylvania Association of Dental Surgeons. He was one of the founders of the Philadelphia Dental College, President of the Seamen's Friend Society, a member of the Academy of Natural Sciences and of the Fish and Game Protective Association of Pennsylvania, was widely known as a distinguished dentist, and highly-esteemed as a public-spirited citizen. Dr. Kingsbury was born in East Windsor, Connecticut, in 1820. Being left an orphan at an early age, he removed to Northern New Hampshire, where he attended the local schools until he was 16, when he became a teacher, at the same time pursuing his studies at the Wesleyan Academy, Mass., and Newbury Seminary, Vermont. He began the study of dentistry at Trenton, N. J. After graduating he came to Philadelphia in 1839, and became actively engaged in the practice of his profession, in which he soon took a leading position, and labored earnestly and persistently for its improvement and advancement. From the foundation of the Philadelphia Dental College in 1863 to 1869, Dr. Kingsbury filled the chair of dental physiology, being subsequently elected to the emeritus professorship. He was exceedingly fond of out door life, and early in his career became an authority on natural sciences and history. He had been in ill health for several months, and during a recent visit to his son in Cleveland, his condition became so serious as to require an immediate return to this city, where death resulted, the cause being uræmia. A wife, one daughter and two sons survive to mourn the loss of an exemplary husband and father.

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ELEVENTH PAPER.

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

(Continued from page 15, Vol. VI, No. 1.)

INDICATIONS FOR EXTRACTION.

IN the preparation of a mouth for artificial teeth there are certain indications for the extraction or retention of certain teeth. Thus, should a solitary central incisor, or cuspid remain, these should be extracted before attempting to make the artificial substitutes. Should there be one molar tooth on one side of the mouth, this should also be extracted. But if one molar tooth be good on one side of the mouth, and its fellow on the opposite side be in a very dilapitated, decayed condition, every effort should be made to restore this tooth, going even to the extent of crowning the root rather than extracting it, for with two molar teeth by which the denture may be clasped the substitutes will be of infinitely more service to the wearer. Such a condition is applicable to both jaws. When the six lower front teeth remain, with two bicuspids on either the right or left side, the bicuspids should be extracted, though they be not decayed, because to let them remain will defeat the usefulness of such a lower denture.

If a cuspid in the upper jaw is growing on the outside of the arch and the size of the arch is seen to be too small for its accommodation. the bicuspid should be extracted so as to permit the cuspid to fall into place. If any of the lower incisors are crowded out of position, it is better to extract one of these teeth. than to attempt to remedy the deformity by a long, tedious and necessarily expensive operation of regulating. If, after a long and faithful effort to cure an alveolar abscess which fails, subjecting the patient to great suffering or causing a constant exudation of pus into the mouth, such a tooth should be extracted. When the roots of the temporary teeth do not absorb, so as to make way for the coming permanent ones, thereby causing

these to be thrown out of their natural position, such temporary teeth should be extracted. Should an upper wisdom tooth erupt with its masticating surface pointing towards the cheek, thereby keeping up a constant irritation, it should be extracted.

Sometimes the lower wisdom teeth are unable to erupt in consequence of a lack of room at the angle of the jaw. In this position the gum overlaying it is constantly pinched at each occlusion of the teeth causing great pain and constant irritation. In such cases, if the first and second molars be good teeth, the wisdom tooth should be extracted, but if either of these teeth be badly decayed, one or the other should be extracted, in order to let the wisdom teeth have sufficient room to take their place in the arch.

PAIN AFTER EXTRACTION.

There is frequently an immediate relief of pain after the extraction of a tooth, yet on the other hand there will be sometimes considerable pain after the offender has been removed. When such pain continues immediately after the extraction of a tooth great relief is often afforded by placing in the socket a pellet of cotton moistened with equal parts of chloroform and tincture of aconite. Or a mixture of one drachm of camphor with two of chloroform, applied on a pellet of cotton to the socket, will likewise afford relief. When the pain continues for several days, as it sometimes will, the following, applied to the socket and to the gums will afford relief:

℞. Morphinæ ....gr. vj.
Tincturæ aconiti ....
Chloroformi............... ....
Alcoholis.........aa....................f. oz. j. M.

HEMORRHAGE AFTER EXTRACTION.

Excessive bleeding following the extraction of a tooth is one of not common occurrence, and this has gone on, despite every effort at relief, sometimes to a fatal termination. When the tooth or root that has been extracted has a decided socket the bleeding may be sometimes arrested by forcing a jet of *ice cold water* into the socket by means of the dental syringe. *Powdered alum* applied in, the socket on a pellet of moistened cotton, and this kept in place by filling the socket with more cotton and this kept immovably in place by means of a cork upon which pressure is kept up by the teeth of the opposing jaws, is likewise resorted to, to prevent or suppress hemorrhage after extraction. Washes made of *salt and water*, of *vinegar and water* of *phenol sodique and water*, of *carbolic acid and water*, (compelling the mixture of the carbolic acid with the water by first mix-

ing this with glycerine, and then adding the water). *The perchloride or persulphate of iron*, either in powder or in solution, *tannic or gallic acid* in powder or in solution, *spiders' web*, *plaster of Paris*, *shellac varnish*, applied on cotton in the socket, have all been used, at times, with effect for the arrest of hemorrhage after the extraction of a tooth. Yet, *sometimes*, all of these have failed, and cases have terminated fatally. A plan has been suggested for the arrest of hemorrhage after extraction, which is to tear or shred the blood-vessels at the bottom of the socket by means of an excavator or a coarse bur that will reach these, on the principle that a lacerated wound will heal more readily than an incised wound. The most troublesome cases of hemorrhage following tooth or root extraction, are those where the tooth or root *has no socket*. The *internal administration of tannic acid* in quantities of *3 to 5 grains* of the drug, in a *half tumbler of water*, taken in one tablespoonful doses, every fifteen minutes, until three doses have been consumed, has proved very serviceable in cases of alarming hemorrhage.

ACCIDENTS.

Fainting following the extraction of a tooth is one of frequent occurrence. This is caused by a lack of blood in the head, and may be remedied by laying the patient in a horizontal position upon the back, placing a pillow under the waist, and if necessary, raising the feet so as to cause the blood to flow with facility to the head. The stimulating effect of brandy or whiskey, so as to increase the action of the heart, may be used to avoid a faint. The use of ammonia, applied to the nostrils carefully, may also be resorted to; the aromatic spirits of ammonia, in doses of a half teaspoonful to a half tumbler of water, administered internally, may likewise be used for fainting. The slapping of the palms of the hands vigorously, and the application of cloths wet with cold water and applied to the face, head, wrists or hands will accelerate the circulation and prevent the faint or restore consciousness; all of such procedures being best applied in the recumbent or horizontal position.

Luxation of the jaw. This accident occurs with some persons in the act of gaping. It is caused by the condyle slipping forward out of the glenoid cavity. When it occurs by the force used in the extraction of a tooth it may be reduced as follows: The operator stands in front of the patient, placing the fingers of both hands over the lower molar teeth, drawing the jaw downward, at the same time pushing the jaw backward. The fingers should be well protected by being covered or wrapped with a napkin, so that when the condyle slips

back into its natural socket, which it does with a sudden snap, the fingers may not be bitten by the occlusion of the jaws. Should the operator not have sufficient strength to accomplish this with his fingers, it may be done with a piece of soft pine stick used as a lever between the teeth.

The slipping of a tooth into the throat. The lower molar cowhorn forceps are valuable instruments for the extraction of these teeth, but as we have said that in their use by the simple closure of the handles the tooth is sometimes made to slip or jump suddenly out of its socket. *They should never be used when the patient is under the influence of an anæsthetic*, and used with care even when the patient is conscious, as it might be that the tooth may be thrown into the wind pipe. An operator prepared for such an accident can readily catch the tooth with his fingers before it falls into the air passage; and an operator should always be prepared for any such emergency.

Dr. Stellwagen says: "*The insane, the idiotic, and children sometimes refuse to open their mouths*, or actuated by anger and revenge, they may bite the operator's fingers viciously. In such cases the dentist can quickly compel them to open by pressing up through the floor of the mouth from the outside with the end of a finger of his left hand upon the point of entrance of the inferior dental nerve at the inferior dental foramen under the angle of the jaw."

ANÆSTHETICS.

These are agents that are employed for the mitigation or entire relief of pain. Anæsthetics are either Local or General. The local anæsthetic limits the effect to a circumscribed part. Of late, the dental journals have been filled with formulas for local anæsthetics, wherein the claims made for these were of a nature to induce one to believe in their infallible efficacy, but the trial of many has induced us to believe that their numbing effect existed more in the imagination of patients than in any real abnegation of pain. The only really useful local anæsthetic with which we are acquainted is the "Hydrochlorate of Cocaine." This drug when used by hypodermic injection is very efficient; but the alarming results which have resulted from its use when thus used, debars its employment. Nevertheless, a German dentist, Dr. Blersch Mannheim, contends that a solution of hydrochlorate of cocaine if not used too strong—a 5 per cent. solution may be injected into the gums safely and teeth extracted by its use painlessly. He prescribes as follows: "I have always a stock of Boehringer's cocaine in tubes containing each $\frac{1}{4}$ gramme (3.8 grains). When the solution is needed, the contents of one tube is introduced

into an empty 5 gramme vial (it generally holds about 6 grammes—about 92 grains) which is then filled with distilled water containing 1 per cent. of carbolic acid solution. In this way I get a solution of cocaine of about 5 per cent. strength, the slight addition of carbolic acid enabling the solution to keep the better. The 5 gramme vial suffices to fill a Parvaz glass syringe five times; a full syringe contains therefore about 0.77 grains of hydrochlorate of cocaine. Half a syringeful injected is sufficient to produce in course of 5 to 10 minutes an adequate anæsthesia.

When a tooth is to be extracted, the cocaine solution should previously be well rubbed into the surrounding gums. In doing so, the cotton wool employed must not be moistened to excess, or the solution will flow into the mouth which should be avoided.

The Parvaz syringe is now half charged, and beginning at the collar of the tooth, is introduced along the roots on the labial side. The canule is now turned in order to produce a small aperture, or sac, into which the solution is injected till the tissues surrounding the roots change color. This pallor is of course only transitory, and disappears directly the cocaine has become absorbed by the gums and porus alveole. Before the canule is withdrawn, the gums should, if possible, be gently rubbed to increase the power of absorption. If in withdrawing the canule part of the solution escape, the patient should be requested to rinse his mouth. A similar injection is then carried out in the lingual or palatal side of the tooth. In most cases one will find that a $\frac{1}{4}$ syringe—0.192 grains of cocaine hydrochlorate suffices. I never inject more than a half syringe.

After injection one should wait five to ten minutes. The forceps, previously of course, must be carefully purified and disinfected, should be dipped into hot water so as to be warmed to at least blood heat. If with injections of cocaine of such minimum strength, any disagreeable results follow, these are by no means symptoms of poisoning, but simply attacks of fainting, to which the patient would have been subject without the injection of cocaine. I therefore avoid employing injections of cocaine when fainting is apprehended, that is, with my timid patients, or those whose dread of the extraction of a tooth has caused them sleepless nights, and whose nerves are shaken. If I do give such patients cocaine, it is only after administering a stimulant. Employed with proper knowledge and care, in minimum doses of 0.190 to 0.385 grain, cocaine is unquestionably one of the safest of drugs, and has the advantage of being so cheap that we can give the poorest patients the benefit of it, since even if we receive

no payment at all, 0.385 grain of cocaine costs only about half a penny."

Many have claimed that a great mitigation of the pain of tooth extraction, is gained by wiping the gum dry on either side of the tooth to be extracted, and in holding a pellet of cotton, moistened with a strong solution of the drug, on the gum for a few minutes, renewing the application until there is a numbness or insensibility of the parts felt by the patient. But while we have tried this, and while the patient reported "no pain," we were disposed to doubt the report, from the twitching of the eyes, as well as the expressions of suffering given off by the patient during the extraction. It has also been stated that when this drug was combined with antipyrine it exhibited its anæsthetic effect more markedly; but we will say for the benefit of our readers, that in our hands such a combination has *not* proved a success. It may be—and we shall keep up our experiments—that future investigation and research will find a formula capable of anæsthizing locally, but up to the present, we have found neither those which are given in the journals or many of those which are sold as secret nostrums, to be not at all effective. Under these circumstances we will not fill these pages with formulas that are not of tried efficacy.

For all minor surgical operations, and particularly for the extraction of teeth no anæsthetic has proved itself so safe and so efficacious as "Nitrous oxide gas." For the *general practitioner* the cylinders which are sold at the depots as the Liquid Nitrous Oxide, are the most serviceable. When made from the Nitrate of Ammonia, it is necessary to have the gas *always fresh*, otherwise it is not effective. and unless the practitioner has considerable extracting to do, the gas may become stale before it is used, whereas with the cylinders this does not happen.

Nitrous Oxide gas is made from the Nitrate of Ammonia, by slowly heating the salt in a glass retort protecting the same from direct contact with the flame of the bunsen gas burner or coal oil stove, by a sand bath. The salt melts at 226° F., white fumes are observed in the retort when the heat is increased, and the gas evolves at about 450° to 460° F. The heat should not be carried higher than this point otherwise the dangerous red fumes of Nitric Oxide will be given off. The gas should be collected in a receiver or gasometer, being passed first through *three wash bottles*, the first of these containing a solution of sulphate of iron or caustic potash, the other two pure water. The object of this being to purify the gas before it enters the gasometer, from which it is inhaled by the patients through the in-

haling tube, A pound of the salt will yield in the neighborhood of 25 to 30 gallons of gas.

The gas has a sweetish taste or odor. Its effects are very evanescent, so that not more than two or three teeth can be extracted with one inhalation, if these consume any time to extract; but where the teeth are easy to remove, as in cases of very loose teeth or roots, six, eight or ten may be removed before sufficient consciousness returns or that the patient is sensible to the pain.

Before administering the gas such teeth as have to be removed should be examined, and the forceps necessary for their removal selected, *but no' exposed* to the view of the patient. A mouth prop should be placed between the teeth on the opposite side of the jaw for the purpose of keeping the jaws apart, as the effect of the gas produces a contraction of the muscles. The mouth props may be made of a cork or of a piece of erasing rubber; and it is a good precaution to tie this with a piece of cord and let the cord hang out of the mouth lest the props should loosen and fall into the air passage. The clothing should be loose around the throat and waist, and the patient should not have partaken of food for two or three hours. If there be any desire to urinate the patient should empty the bladder before the administration of the gas, and the operator should be unwavering in his action, *never to administer the gas to females unless they are accompanied by friends or relatives.* No one should be in the actual presence of the patient but the operator and his assistant, though the friends may be near at hand. No conversation or noise of any kind should be indulged in or permitted, but the soothing effect of music from a musical box has a tendency to allay any nervous feeling and to quiet any evil apprehension.

These preliminaries being attended, the hood is placed over the nose and mouth (if a hood is used) or the mouth piece placed in the mouth. The lips are held close to the mouth piece and the nostrils closed by the fingers of the operator, and the patient directed to take long full inhalations. The effect of the gas soon becomes apparent by a spluttering of the lips around the mouth-piece, a ghastly color of the countenance, and a snoring at each respiration. These are the indications of the anæsthetic state, but one of the best tests of entire insensibility is to touch the "conjunctiva" (or mucous membrane which covers the anterior part of the globe of the eye and is reflected to the free edges of the eye-lids) with the end of the finger, and should the patient show no twitching from the touch the anæsthesia is complete and the tooth or teeth may be extracted without pain.

Dr. Warren states that from *five* to *fifteen* gallons of gas is the amount most ordinarily necessary; but he has had cases requiring as much as 65 and another of 80 gallons before the anæsthetic stage was reached. He also states that the *first stage* exhibited in the administration of this anæsthetic is *muscular activity*, the *second stage*, *muscular rigidity*. When this is the case the administration should cease: if continued until muscular relaxation is attained, the patient might die of asphyxia.

DANGERS.

Kidney diseases, heart disease, lung disease, brain tumors, enlarged tonsils, the obstruction of respiration, alcoholism, are the contra indications in the administration of any general anæsthetic.

The patient taking an anæsthetic should be seated in a reclining chair, one in which the horizontal or even the inverted position may be readily attained. Should the action of the heart cease, the agent should be immediately withdrawn, and fresh air given. If the lungs do not fill, the tongue should be drawn forward so as to admit air into them, by seizing this organ with the fingers or with a pair of forceps and drawing it forward. The operator should not lose his head or become excited. Nitrate of amyl placed to the nostrils is beneficial, but only two or three drops on a handkerchief should be used, or the spirits of ammonia may be used, almost as efficiently. "A galvanic shock is often very serviceable, the positive pole being placed on the nose and the negative pole over the diaphram."

Artificial respiration is often in these serious cases necessary, but the *inverted position* long persevered in, seems the most effective. Warmth should be applied and the extremities vigorously rubbed upwards. Those who administer anæsthetics should be provided with all the accessories to meet such emergencies. It is a bad time to hunt up this agent or that when the trouble is upon you, or to find out that your galvanic battery is out of order when it is most needed. It is better, when the patient presents, and the preliminary examination made, to determine then whether it is safe or otherwise to administer the agent. In this way these accidents can be averted by the dentist refusing to operate in any case of a doubtful, suspicious, or contra-indicating character. If however, these alarming sequences come on despite appearances which did not point to them, it is well to know how to act in the emergency and how to produce natural respiration by artificial means.

The object sought by artificial respiration is to produce an aeration of the blood artificially. This may be done by alternately expanding

and contracting the chest. If the chest or thorax be pressed downward all the air that it might contain is expelled, and when it is expanded, as it may be by certain motions of the arms, a vacuum is produced and this will cause the air to be sucked in so as to fill the vacuum.

If a patient fails to be relieved by the drawing forward of the tongue, he should be placed on the floor flat on his back. A large book, or a soft pillow, or the operator's coat folded may be placed between the shoulders, or preferably at the small of the back, so that the head will be lowered. The open hands of the operator should be placed on the sternum near the soft part of the chest, and pressure made so as to force out the air from the lungs. When the pressure is removed the elasticity of the parts will resume to a certain extent the normal condition whereby an amount of air is drawn in, inducing a sort of

FIG. 192.

inspiration. Thus, by these alternate movements an expiration and inspiration is induced. Dr. Holmes in his system of surgery says: "A manual pressure equal to about thirty pounds may be with perfect safety applied to a healthy adult human thorax." "The manual pressure ought to be made on the lower part of the sternum, for the resistence of the thoracic walls is there greatest; and the pressure on the abdomen at the same time is not to be omitted, or the diaphragm will descend and counteract the benefits derived from the pressure made on the lower part of the chest."

From Dulles' Accidents and Emergencies we give Silvester's Method for producing artificial respiration. "Lay the person to be treated upon the back, then kneeling behind the head, seize each arm near the elbow and move them round horizontally, first away from the body, then over the head till they meet above it (as shown in Fig. 192),when they should be given a steady pull for a few seconds. This

fills the lungs with air by drawing the ribs up and so enlarging the cavity of the chest. The second manœuvre consists in returning the arms to their former position along side the chest (as shown in Fig. 193), and making strong pressure against the lower ribs, so as to drive the air out of the chest and effect expiration. This should occupy but a second of time, and be repeated about sixteen times per minute for some time, and not abandoned until it has been certainly ascertained that the heart has ceased beating."

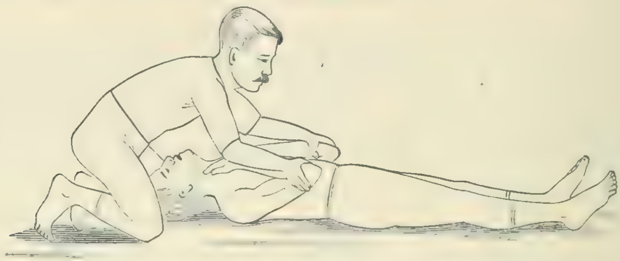


Fig. 193.

Dr. Guilford in his work on "Nitrous Oxide" says: "In all cases the respirations should amount to at least thirty or even forty per minute. The natural respirations are only eighteen per minute, but in cases of resuscitation, as our object is to arterialise the blood even more rapidly than in health, and as we cannot introduce by artificial means the same amount of air that is taken in by the normal efforts, we must proportionally increase the number of respirations."

In the same spirit that we have advised that, all appliances should *always be in readiness* to meet accidents and emergencies, we would advise those who use anæsthetics for the extraction of teeth, not merely to content themselves with the *reading* or even of the *study of the means of resuscitation*, but to actually *practice the motions on some conscious person*, so that when the test comes he will not have to think how it is to be done, but be able to do it without hesitation.

[TO BE CONTINUED.]

We congratulate the *Dental Advertiser* on its acquisition in having the services of such an eminent man as Dr. Barrett as its editor. The *Advertiser* is not in "a slough of despond," but were it, we are sure Dr. Barrett could raise it as he did the *Independent Practitioner* to be one of the first dental journals of the land.—[Ed.

ELEVENTH PAPER.

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Phila., Pa.

Q. Is the constitution of one parent or the other more apt to affect the child?

A. The influence of constitutional defects is more apt to be promulgated from the mother than from the father.

Q. What is supposed to be the cause of the fissures, or pits, or checks which we notice in the enamel of the teeth?

A. It has been ascribed to an arrest in the development of that tissue, of its failure to flow evenly, or coalesce from its different points of formation, whereby these defects are noticed.

Q. What is considered to be the exciting causes of caries?

A. It is most generally conceded to be the action of chemical agents, which disintegrate the inorganic constituents of the teeth.

Q. Whence comes these agents?

A. In the vitiated secretions of the mouth, the abnormal secretions of the stomach, and of the saliva and mucus, and the putrifaction of such food materials as are held in contact next to or between the teeth.

Q. Were these views held to any extent?

A. Yes, a number of French writers of the last century expressed the belief that dental caries was the result of chemical action of agents found in the mouth.

Q. Were these views proven?

A. Yes: Dr. T. R. Mitchell conclusively proved the existence of acids in the mouth capable of destroying the teeth, in the year 1796, and in this country, in 1821, Drs. L. S. & Eleazar Parmly held the same views.

Q. What acids seem to act most vigorously on the teeth?

A. Acetic, citric, and malic acids.

Q. Whence are these acids derived?

A. Acetic acid derived from vinegar, citric acid derived from lemons, malic acid derived from apples, pears, &c.

Q. Who has lately given much attention to the cause of Dental Caries.

A. Dr. W. D. Miller, an American dentist practising in Berlin. He maintains, after the teaching of several hundred experiments, that decay is caused either by the introduction of strong acids into the mouth, or by weaker acids which is the result of the fermentation of farinaceous or saccharine food. "After the distinction of the enamel,

the process of disintegration attacks the organic matter, and first of all the micro-organism, which causes an endless variety of changes in the dentine, until finally it presents the appearance of a mass of decomposed matter, intersected in every direction with fungi.

Q. Could you give me the deductions gleaned by Dr. Miller from his investigations.

A. *First.* The contact of saliva with amylaceous or saccharine food (not to speak of nitrogenous food), or a solution of sugar or starch in saliva, kept at body temperature, invariably gives rise in four or five hours to a strong acid reaction, due to the generation of an organic acid.

Second. There must consequently be in the human mouth a constant, though variable, generation of acid, because of the impossibility of keeping the mouth perfectly free from food and from solutions of amyloids in saliva, which penetrate cracks, pits and fissures, and are held by capillary attraction between the surfaces of the teeth in contact, and there become acid by fermentation.

Third. The degree of acidity depends somewhat upon the length of time which has elapsed since partaking of food, and will be found greatest on rising in the morning.

Fourth. A cavity of decay in which saccharine or amylaceous food has remained for some hours must, and will be found, always and without exception, to have an acid reaction.

Fifth. The extent to which any tooth suffers from the action of the acid depends upon its density and structure, but more particularly upon the perfection of the enamel and the protection of the neck of the tooth by healthy gums. What we might call the perfect tooth would resist indefinitely the same acid to which a tooth of opposite character would succumb in a few weeks.

Sixth. An occasional possible absence of an acid reaction in a cavity of decay is no indication that acid has not participated in the production of the cavity. Little or no value can be attached to tests of the saliva alone.

Seventh. Any general or special disorder or condition of the system which results in the withdrawal of lime salts from a tooth, or in lowering its density, or in a weakening of the chemical union between the organic and inorganic matter of the tooth, renders it more liable to decay.

Eighth. Strong acid and corroding substances brought but momentarily into the human mouth, may give rise to lesions of the enamel at points where the ordinary agent alone could never have begun.

Ninth. All microscopical appearances and characteristics of caries may be produced with the greatest exactness *out* of the mouth, simply by subjecting teeth to these acid mixtures which are constantly to be found *in* the mouth.

Tenth. The superficial layers of carious dentine undergo an almost if not absolutely complete decalcification, which decreases as we approach the normal dentine. The same is true of dentine decalcified in saliva and bread.

Eleventh. The destruction of the organic constituents follows (not precedes) the decalcification, and is evidently, for the most part, to be ascribed to the action of the fungi.

Twelfth. The fungi found in the human mouth do not participate *directly* in the process of decalcification. The exact part which they perform in the production of acid reaction requires further investigation.

Thirteenth. The fungi produce the most manifold anatomical changes in the softened dentine, resulting in the complete obliteration of the structure and final disappearance of the tissue in a mass of debris and fungi.

Fourteenth. The invasion of the micro-organism is always preceded by the extraction of the lime salts.

Fifteenth. The destruction of the tissue remaining after decalcification is effected almost wholly by fungi alone.

Sixteenth. Inflammation can hardly be looked upon as a very important factor in caries of the teeth.

Seventeenth. Caries of the enamel is purely chemical, the decalcification resulting at once in the complete dissolution of the tissue.

Eighteenth. Caries of the cement runs a course analagous to caries of the dentine, a softening of the tissue by acids, and following this its destruction by fungi; a slight inflammatory action on the part of the living matter in the corpuscles, is not to be excluded.

Q. Do all acids act alike on the teeth?

A. They do not. Some seem not to act on them at all while others attack them with considerable vigor.

Q. How do acids find their way in the mouth?

A. Dr. George Watt in his "Chemical Essays on Caries of the Teeth" says: "Oxygen and nitrogen uniting in the mouth, in whatever proportions, *nitric acid* must be the ultimate result, as air and moisture, the only agents necessary in the transformation, are here always present. Mucus and particles of nitrogenous food lodged about the teeth undergo decomposition, and yield nitrogen to the

oxygen of the atmosphere, or of the fluids of the mouth. Organic nitrogenous bodies contain hydrogen and oxygen, as well as nitrogen; consequently by their decomposition these elements are all liberated. The mutual affinities of hydrogen and nitrogen take precedence, and the result is the formation of ammonia; ammonia exposed to the action of oxygen is always decomposed; oxide of nitrogen is formed, and nitric acid is the result."

Q. Is the presence of particles of nitrogenous food the only way by which acids may be formed in the mouth?

A. No. Nitric acid may be formed in the mouth by the agency of galvanic action. This may be generated by two metals placed in the mouth in close proximity to each other, as in the case of gold and tin filling in adjoining teeth, and the fluids of the mouth acting on one of them. And if they are so situated that the mucus membrane forms a connecting conductor by being in contact with both, a current may be established sufficient to decompose any of the binary compounds contained in these fluids.

Q. What do you mean by binary compounds?

A. It is a term used in chemistry to signify a compound of two elementary substances.

Q. Is nitric acid generally formed by such galvanic action?

A. It is sometimes, but it is thought that hydrochloric acid is more likely to be the result.

Q. How do you reconcile these contrary statements?

A. Those who contend that nitric acid is formed in the mouth, whether by galvanic action or otherwise, argue that it combines atom by atom as rapidly as it is generated, with the elements of the tooth structure, and that all the conditions necessary for its formation exist in the mouth; and because it is not found in the free state in the mouth is no evidence that it does not exist there.

Q. Does Dr. Miller's investigations favor the presence of nitric acid in the mouth?

A. No, he opposes it, on the grounds that as putrifying animal substances having been found in carious cavities, and an alkaline reaction instead of an acid obtained from the tests of the carious matter of cavities, he disputes the presence of nitric acid and its influence in producing "white decay."

Q. How do you account for the presence of *sulphuric acid* in the mouth.

A. Albumen is one of the constituents of mucus, and albumen is likewise contained in many articles of food. Sulphur is also a con-

stituent of many articles of food, and even were it not, sulphur is always found united with albumen. Sulphur and oxygen unite directly, under various circumstances. Sulphuretted hydrogen is one of the results of the putrefactive decomposition of albuminous substances. The oxygen of the atmosphere rapidly decomposes this acid by taking its hydrogen to form water. The sulphur is therefore set free, and being in its nascent state, its affinities are increased in energy, and it unites with oxygen, forming sulphurous acid, which in the presence of the saliva is rapidly converted into sulphuric acid.

Q. Is sulphuric acid as potent a destroyer of tooth tissue as some other acids?

A. Sulphuric acid has less affinity for the constituents of the teeth, and the black decay resulting is not so common as some other varieties of decay, nor is its progress so rapid.

Q. Why is black decay less rapid than decay of a lighter color?

A. Because sulphuric acid does not break down the texture of the tooth to the same extent as do other acids, because it has less affinity for its constituents and therefore does not unite with them as readily or decompose the early salts of which it is composed as quickly as other acids.

Q. What is the generally accepted theory of dental caries called?

A. The chemico-parasitic theory.

Q. Will you describe this theory?

A. The enamel is first destroyed by the action of fermentation at a favorable point in the crown of the tooth. As a depression or cavity is thus formed it gives lodgment for micro-organism, which at this stage can penetrate the dentinal tubuli, and the process of decalcification not only continues but is facilitated by the acid formed by these micro-organisms, until the organic portion of the tooth alone remains, which at length undergoes putrifaction.

Q. If we know the cause of decay what means would you recommend for its prevention?

A. The thorough cleansing of the teeth with the brush, the quill tooth pick, the waxed dental floss, combined with antiseptic washes on the brush, and in the form of the spray atomizer, and properly prepared dentifrices.

Q. What would you use with the tooth brush, and how would you use it?

A. I would use dentifrice on the tooth brush, and with dentifrice the teeth may be cleansed, which is not the case with tooth soaps or tooth washes. The grit of the tooth powder removes the accumula-

tions which form on the tooth, which is not the case with tooth soap or tooth washes. The latter may be regarded more as a toilet article to impart a pleasant sensation of cleanliness or fragrance to the mouth. The brush should be used across the teeth from side to side in the upper and the lower jaws, and it should be used up and down (the upper teeth down and the lower teeth up) so that the bristles of the brush may pass between each of the teeth to remove any particles of food which may lodge therein.

Q. Will the brush do this effectually?

A. Not so effectually as either the quill tooth pick or the waxed dental floss.

Q. How shonld the dental floss be used?

A. It should be passed between each tooth and used with a sawing motion, pressing it first against one tooth and then against another so as to remove all small particles of food which may have lodged there.

Q. What should follow this?

A. The mouth should be well rinsed with water, after which the teeth may be sprayed with an atomizer in which there is an antiseptic wash—or the teeth may be brushed with a pleasant tooth wash.

A COMBINATION OF METAL AND VULCANITE WORK.

By Charles P. Chupein, D. D. S., Philadelphia, Pa.

The objection which is urged against a vulcanite plate is, that, as it is a non conductor of thermal changes, the gums which are covered by the plate is kept hot, and that the refreshing feeling induced by the taking into the mouth of cold food or liquids is not experienced by the wearer.

It has occurred to us that the object might be easily attained by the use of a metal plate, gold, platinum or aluminum as follows:

A die and counter die are made. Should the gums present a protusion this will be of no consequence, so that even if the model drags in the moulding sand at this point it will make no difference.

The plate is swedged so as to come even with the outer edge of the ridge, not to lap it. The plate may be made plain, or a vacuum chamber attached to it at the pleasure of the operator.

When the plate is swedged it is nicked, and each alternate nick cut out as shown by Fig. 1.

When the teeth are ground and articulated, a matrix is made to hold them in position, the wax is removed and the nicks bent up as is shown in Fig. 1. The case is then waxed up, flasked, packed, vulcanized and finished. In this way the teeth are held

firmly to the plate. This plan may be employed for a temporary as well as a permanent plate. In the case of a temporary plate, when the gums shrink to such a degree as to make the teeth uncomfortable to the patient, or do not hold in place from the lack of

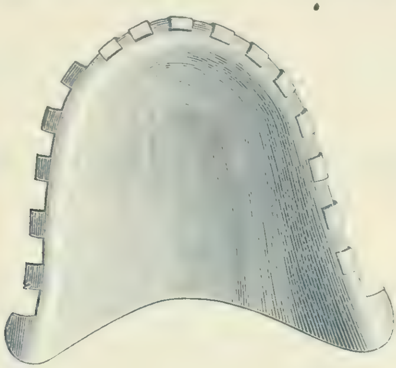


FIG. 1.

proper adaptation or general absorption of the gums, the teeth may be removed from the plate, and the same plate re-swedged by means of new dies and counter dies; this may be done provided there is no central soldered air chamber. If the plate has such a chamber, then of course the case becomes more difficult and entails more work. On one side of Fig. 1 the nicking of the plate is not turned up to show how it is to be done before these parts are turned over or bent so as to engage in the vulcanite.

THE RATIONAL USE OF VULCANIZABLE RUBBER.

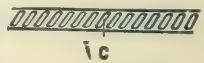
W. N. MURPHY, D. D. S., LAGRANGE, TEXAS.

[Read before the Texas Dental Association, at Waco, Texas, at its Annual Session, 1891.]

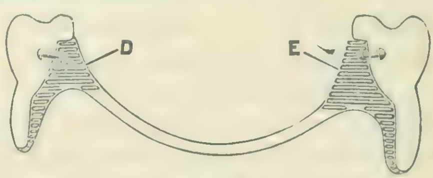
Vulcanizable rubber, having become almost the universally accepted material as a base for artificial dentures, it behooves us to avail ourselves of the best methods possible in order to attain the highest results. In order to do this, it becomes necessary for us to study it from a scientific, as well as a practical point of view. But, however much I may desire to go into the scientific details of it, the time alloted to this paper is too short; therefore I can only scan it briefly in order to deal more with the practical side of the question. Rubber becomes liquid at about 275 degrees Fahr., and a plate of pure rubber, with its coloring matter is then thrown out against the invest-

ment incasing it, as shown by figure No. 1, in such a way as to form a shield, or complete incasement, for the inner portion of the mass which is made up of rods of rubber extending from center to circumference, forming tubes filled with sulphureted hydrogen gas, or, in other words, the pressure of the gas forms the tubes. This gas escapes freely as long as the rubber remains in a liquid state. But, at about 300 degrees Fahr., the rubber begins to harden on the surface, and as the temperature is raised the hardness increases, penetrating deeper into the mass. When the rubber begins to harden on the surface the retention of gas begins and a slight expansion takes place. As the pressure of the gas increases which has a tendency to force the rubber to the circumference, leaving the tubes larger in the center and the rods smaller, as shown by figure No. 2. The larger or the thicker the mass of rubber, the greater the volume of gas and the larger the tubes, consequently the more por ous the plate when the outer surface is removed in the finishing process. If the plate is very porous, which is the case in thick places around the alveolar ridge, when the surface is scraped off the rods will have a tendency to curl upon themselves, as shown by figure No. 3. This will draw the rubber away from the necks of the teeth and pins, sometimes making them loose on the plate, though this is not the only cause for this defect in dental plates. When the surface is removed, and this porosity exposed, it furnishes receptacles for the accumulation of effete gases which, I am sorry to say, are in almost every human mouth.

No . 1.



No. 2.



No. 3.

Then rubber having the following practical objections, viz.: discoloration (especially pink), breakage, porosity, contraction or drawing away from the teeth, as designated by some, and incompatibility with the mucous membrane of the mouth, the question arises : How are we to impart to it that elasticity, toughness, lightness and strength coupled with the bright and translucent life-like appearance that

should characterize every artificial denture, and at the same time restore or prevent a sunken in or contracted facial expression, and give the best results in the preparation of the food for alimentation? But in taking up the last prerequisite for a successful denture I shall have to digress to discuss the merits and demerits of plain teeth and gum sections. Notwithstanding the almost endless variety of sizes, shades, etc , of gum sections furnished us by our progressive manufacturers, there are many, yea a large majority of the cases arising in the practice of a busy dentist in which it is impossible to give a proper occluding surface and maintain symmetry and beauty with anything but plain teeth. With the more improved forms of plain teeth, with their broader masticating surface, we are enabled to contort them into such position as to meet the demands of almost any conceivable case and to mislead the eye of the critic. Then in order to overcome, to a great extent, all and singular the foregoing objections, except that of incompatability, we will proceed to construct a full denture, supposing the mouth to be ready for a permanent set, although it is not essentially different for a temporary one. Take upper impression with plaster, using salt to hasten the setting and a few drops of cochineal in the water to color it. Take all lowers with modeling composition, never using it after it becomes old and tough. After making models boil them fifteen or twenty minutes in sterine and prepare wax forms for taking bite, which should be carefully done, so as to indicate the exact length for the teeth, then harden in cold water. Now place a thin layer of soft wax on one of them and put both in the mouth, putting the left hand on the forehead and the right on the back of the neck, force the patient's head back and at the same time directing to close the mouth and hold firm, which will insure a natural closure. The median line is then marked up and down, the position is then noted or marked for the canine teeth. Then, with the point of a small instrument, make a mark in the wax rim from one corner of the mouth to the other, equally dividing the lips. The case is then put in the articulator, and a strip of paper, about one-fourth of an inch wide, is pasted into the upper model with a drop of hot wax, one at each corner of the mouth and one in the center, and coming down to the mark indicating the dividing line for the lips. Plain teeth are then mounted accordingly and the wax gums carved up just as they are to be when the case is completed and ready for the mouth. And I wish to be understood by this that there is to be no scraping, filling or polishing to complete the case after it is vulcanized, except the little to be mentioned later on. Now, having carved up the wax

gums to the proper form, thickness, etc., cut a pattern of No. 60 tin-foil to cover all of the lingual surface of the wax, which is to be well burnished down on that portion of the wax, which is to be only one thickness of pink, with no air chamber under it. The tin is then so trimmed and adjusted as to completely conform to the necks of the teeth. A strip, say one-fourth of an inch wider than the wax rim of the alveolar ridge, is then drawn round from heel to heel, and so completely and so nicely burnished down to the wax, and so accurately trimmed and adjusted to the festoon margin of the gums that no trace of wax that is to be replaced by rubber will be left exposed to the plaster investment ; there should be no trace of wax left on the teeth. The upper edge or the excess in width of tinfoil is then cut into V-shape notches and the V's turned at right angles, then it is ready to invest right up to the upper edge of the wax, with the teeth down ; the V's are then turned down into the soft investment of the first half, so as to prevent the tinfoil tearing down in flasking the case after it is packed. The wax is now washed out and the teeth, pins, and all parts are wiped off with chloroform so as to remove all traces of wax. The packing is then done so as to have just one thickness of polson pink rubber as a facing for that portion of the labial surface exposed to view when in the mouth, no traces of the red rubber being visible through the pink. No waste gates are to be used, consequently great care must be taken in the process of packing. Now run the vulcanizer up to 275 degrees and let it stand fifteen minutes, then take fifteen minutes to run up to 310, and then cool down slowly. —*Texas Dental Journal.*

CONSULTATION FEES, ETC.

LETTER FROM DR. TRUMAN W. BROPHY.

The March number of the *Dominion Dental Journal* is just received. I find it filled with very interesting matter, and, therefore, I feel that the profession of Canada is to be congratulated on having at home so able an exponent of scientific dentistry.

The first, or leading article, from the pen of my friend, Dr. W. C. Barrett, whose well-directed enthusiasm has on many occasions held the attention of the largest and most distinguished gatherings of dentists at home as well as abroad, will fill an important place in our literature. This article will make us all feel quite well acquainted with Dr. Miller, not only by reputation, but it really seems to establish intimate relations between us and our scientific friend.

The achievements of Dr. Miller may well call forth the applause of his countrymen.

The work he has done has contributed more to the scientific advancement of dentistry than all previous researches in this direction.

The warm friendship between Drs. Miller and Barret, makes the article of far more than ordinary value. Personally, I feel under obligation to you for the JOURNAL, and to Dr. Barrett for the valuable article it contains.

An article from Dr. A. C. Cogswell, whose acquaintance I do not enjoy, and yet I feel that he is one of my brethren, and therefore I must know him, for do we not strive with the same problems, meet the same obstacles, and pass through the same experiences along the uncertain pathway of life? The article he presents on "Professional Advice" is of a nature to place many dentists in an attitude becoming professional men.

No dentist should do his profession so great an injustice as to habitually hold consultations with his patients without receiving a fee. Such a course while no doubt quite prevalent, is far from elevating to dentists. It should be practised only in free dispensaries and hospitals. Among a few of the members of the profession of our city, hours for consultation and advice are announced on their appointment cards, and during *those hours only* will the dentists see patients for consultation. Such a disposition of time makes it possible to see patients for short intervals, and, besides, what is of more importance, the dentist is not interrupted during the time he is engaged filling teeth, or performing other operations, which require careful continuous attention.

Nor is this all; there is often an injustice done to patients by leaving them with rubber dam in place, in an uncomfortable position, while others occupy our time. This should not be so. There are some well-established rules of practice in other professions, which are equally as applicable to ours, and Dr. Cogswell has very tersely pointed them out. I trust members of the profession who *give* their time and the benefit of their professional knowledge to their patients during consultations, may see the injustice thus done to themselves, their families and the profession.

Whoever seeks the advice of a professional man does so for the purpose of benefitting himself, and there is no reason why a suitable fee should not be received by the consulted for the services rendered.

Many years ago a large class of physicians occupied about the same position that dentists do to-day in this matter.

It was, indeed, esteemed a compliment by them, to receive a visit from a citizen who desired medical advice ; and for advice alone, or for time occupied in consultations with other physicians, fees were not usually received.

A well informed dentist can do his patients, especially young patients, children, more good by advice than operations which involve great expense. If it were possible to awaken that interest in parents, which would induce them to consult a dentist with their children, and consult him frequently, much suffering would be avoided, besides the dentures of our people would very materially improve.

I have written more than I intended when I began this letter, but my interest in the subject has led me on.

Wishing the JOURNAL the highest degree of prosperity, which it so justly merits, and hoping that all our professional friends in Canada will attend our big dental meeting during the Columbian Exposition. I am, fraternally yours,

TRUMAN W. BROPHY.

A LOCAL ANESTHETIC.

I have learned from one of the prominent specialists of our city that he was using a preparation of cocaine with which he was getting much more satisfactory results than when using cocaine alone. He assured me had never seen a case of constitutional disturbance since he had been using it, nor any other unpleasant results. This gave me new hope, and under the promise of secrecy I secured his formula, and commenced at once to use it. I have injected the solution sixty times, without a case of constitutional disturbance, or the least unpleasant results.

I have permission of the gentleman now to give the formula.

Cocaine hydrochlorate..........................gr. 20
Sulphate of atropia...............................gr. 1-10
Carbolic acid, crystals..........................gr. 10
Chloral hydrate.....................................gr. 5
Add one ounce of pure water.

Use hypodermically.

You will naturally inquire why the addition of the atropia, carbolic acid and chloral makes the use of cocaine less objectionable. I will try to explain : 1. Atropia, in small doses, such as you give in hypo-

dermic injections from this preparation, is a cardiac, respiratory and spinal stimulant, which tends to counteract the toxic effects of the cocaine. 2. Carbolic acid aids the chloral in localizing the anesthesia, and both tend to increase the anesthetic properties of the cocaine and localize the effects, and both aid in the preservation of the solution, which is, of itself, quite desirable, as the ordinary cocaine mixture is almost worthless at the end of a week, while this preparation is good for months.

In extracting, my plan is as follows: 1. Fill the barrel of the hypodermic syringe with the fluid, then adjust the needle and make sufficient pressure on the piston of the syringe to force a few drops through the needle. By this means you obviate the danger of injecting air into the tissues. Begin at the margin of the gum on the labial side, introduce the point of the needle, and gently push it into the gum tissue on a line with the roots as nearly as possible, and when a depth has been reached nearly corresponding with the length of the roots, the needle should be slightly withdrawn to produce a small space or pocket, into which five or ten drops of the fluid should be forced. Before the needle is withdrawn, a slight pressure should be made on the gum opposite the point of the needle. This scatters the cocaine and hastens its absorption by the alveolus. A similar injection should then be made on the lingual side of the tooth. If, in withdrawing the needle, any portion of the fluid should escape, the patient should be instructed to rinse his mouth. I usually wait about five minutes after injecting the gums before extracting.

The amount of cocaine injected varies from one-half to two and one-quarter grains. If there is a number of teeth to extract, and conditions favorable, I do not hesitate to use a second syringe full of the fluid, or a total of sixty minims; but this is the limit; I never go beyond it. The extraction of the teeth of course liberates a large part of the cocaine, hence, more of it may be used for this purpose than where there is to be no bleeding Should you get toxic effects with this preparation, administer a stimulant; one of the best is dilute alcohol.

I have heretofore spoken of the use of cocaine for extracting only, but it is quite as valuable in the operating room as at the extracting chair. In making deep buccal or proximal fillings, you can save much of the pain, as well as win the confidence of your patient, by injecting the gum with a few drops of cocaine before adjusting the dam. It is also invaluable in the treatment of pyorrhea, and other inflamed conditions of the gums about the necks of the teeth. This,

intelligently used, will rob dentistry of half of its terrors, and win the grateful commendation and esteem of your patients. Dr. Guibor says that he has never seen a case of constitutional disturbance, at any time, from using this remedy. His rooms are filled almost all the time. He is a specialist in the treatment of the nose and throat; has quite a reputation among us; spent thirty years in the practice of medicine, and then took up this specialty; uses it much oftener than I ever have, and has found it to act act charmingly.—*Western Dental Journal.*

REMOVAL OF PULP WITH COCAINE.

Doubtless every practitioner has experienced unpleasant results and delay in attempting to devitalize pulp with preparations of arsenical paste. To all those who have not yet given it a trial, I would recommend in the place of arsenious acid a twenty per cent. solution of muriate of cocaine. Have it prepared in small quantities, as it is more reliable when fresh. I have successfully removed the pulp with a four per cent. solution, but less time is required if a stronger one is used, and twenty per cent. seems to answer very well. Apply the rubber dam, and cleanse the cavity as well as possible without causing pain. Saturate with the solution on a pellet of cotton, and after a few minutes carefully and thoroughly expose the pulp. More cocaine is applied, and with care it may be worked down the canal with a broach till the apex is reached without much pain. The pulp can then be painlessly twisted out with a broach on which are wound a few fibres of cotton, canals dried with hot air, filled with chlora-percha, and the operation completed at one sitting.

CHAS. C. PATTEN, D. D. S., Machias, Me.

NITRATE OF AMYL IN CHLOROFORM POISONING.

BY E. MAMMEN, M. D., BLOOMINGTON, ILL.

I desire to add another case of chloroform poisoning treated successfully by the inhalation of nitrate of amyl. The facts are as follows: At about 7 p. m. of March 13, 1890, I received a telephone message to come hastily to M. P——, who had taken chloroform and could not be awakened. The distance was about one and a half miles, and I stopped at a drug store to procure five-drop pearls of nitrite amyl. Time of arrival was about half an hour after being called. I found the patient in a profound stupor, respirations shallow, pulse rapid and feeble. A three ounce bottle was found in his

coat pocket half full of Squibb's chloroform. A telephone message to the druggist revealed the fact that he had purchased three ounces of the drug some two hours before. He had swallowed apparently about one and a half ounce. Air was at once freely admitted to the room and to the patient, and a pearl of the nitrite given by inhalation. The effect was immediate and apparent. After the lapse of of fifteen minutes, pulse again became rapid and feeble, and another pearl was used, with the result of deepening the respirations and increasing the vigor of the pulse. The same thing was repeated at lengthening intervals eight or nine times. Meanwhile hypodermic injections of atropia were twice given and towels wrung out of cold water dashed upon the chest. After four hours the patient awoke from his stupor and in another hour was out of danger. Recovery was somewhat slow, owing no doubt partly to the great destruction of red blood-corpuscles, as evidenced by the extreme icteric hue of the skin, which persisted for two weeks. In my judgment this patient could not possibly have survived without the use of nitrite of amyl.

NECROSIS OF THE ALVEOLUS.

I have just completed the cure of a case of "Necrosis of the Alveolus," and thinking that it might interest some of your readers, I give you the history of it.

About four months ago, Mayor Wells, of Boone, came into my office with a fistulous opening nearly as long as a pea. It was situated below the root of the left lower central, opening on labial surface. The pus was flowing from it constantly. As the tooth was dead and loose, I extracted it, thinking that would produce a cure. Three months later, however, he came back accompanied by his physician, and with indications of a much more serious trouble than at first suspected. He had gone to one surgeon who shoved a lance through the gum, and gave him no further treatment. Still the case grew worse. He then went to another physician who brought him to me for treatment.

Examing through the opening with a probe, I could feel the honey-combed state of necrosed bone. I first made an incision about an inch in length, reaching from above the opening to the base of the alveolus. I laid the tissues back and scraped the jaw and socket thoroughly, till I could feel sound bone under the probe.

I then flooded the cavity with pure carbolic acid, carefully protecting the lips, and filled the cavity with cotton dipped in camphophenique. For the first week he came to me every day and I

changed the cotton, after washing out with peroxide of hydrogen. Once or twice during the treatmeut, I burnt the socket with the acid, so as to induce more granulations and not leave a depression just back of the lip.

The flow of pus stopped in about four days after the operation, and to-day there is no sign of trouble.

J. P. Collins, Boone, Iowa.

THE PRACTICAL PLACE.

Dr. I. A. Osmun—I never administer nitrous oxide gas without looking at my hypodermic syringe to see if it is in good working order. * * * * The insertion under the skin of equal parts of brandy and ammonia acts like magic, stimulating the heart's action and the respiration. This is always my sheet-anchor of hope. I should like to commend this practice to you.—*Cosmos.*

Harmless Substitute for Cocaine.—After considerable study and experience in the use of cocaine for the painless extraction of teeth, I have been forced to the belief that that medicine was not at all what could be desired for the accomplishment of that end. On the 8th day of July, as an experiment, I injected distilled water into the gum around the tooth until the gum became almost perfectly *white*, and extracted the tooth, with the result that there was very little or no pain. On successive days I performed the following operations with the following results:

July 8. Two badly decayed lower bicuspids, both ulcerated, *without pain.*
Second case. Lower left third molar, *without pain.*
Third case. Two upper third molars, *considerable pain.*
July 9. Lower right bicuspid, *without pain.*
Second case. Lower right, first bicuspid, ulcerated, *slight pain.*
July 11. Lower left second molar, *slight pain.*
July 13. Lower right first molar, *no pain.*
July 14. Second upper right bicuspid, *considerable pain.*
Second case. Upper right second bicuspid, *very slight pain.*
July 15. Lower left first molar, *very slight pain.*

I have used it since July 8 in the above manner, and find that my success has been marked as with cocaine, with no risk of poisoning. Having matched all the above cases, I found that with the exception of the last one they all healed rapidly and without soreness, while with cocaine, most cases suffer from extreme inflammation of the gums.—*Dr. F. A. Lane, Macomb, Ill.—Ibid.*

A Neat Rubber Dam Holder.

Dr. Platt, of Sterling, Scotland, is the inventor of a clever little device for retaining the rubber dam in place when the use of a clamp is inexpedient. It consists of a pin with a bead head, which fits into a small tube also provided with a bead head. The tube is passed between the necks of two teeth from the buccal side, after the rubber has been adjusted, and the pin is then slid into the tube from the lingual side. This keeps the rubber securely in place and leaves the four walls and crown of the tooth to be operated upon, entirely free from obstruction. The pins are made in different lengths from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, to suit different cases, and of about the same diameter as an ordinary small toilet pin. The tubing to match can be had in lengths from the jeweler's supply establishments, and cut to suit, while the beads used for the head of the pin and tubes are the ordinary white embroidery beads, small size.

To Remove the Odor of Iodoform from the Hands.

For this purpose Bienert recommends (Pharm. Zeitschr. Russl.) washing the hands once or twice with flaxseed-meal in water. He states that the odor very quickly disappears.—*Duetsche Med. Zeitung.*

Antidote to Cyanide Poisoning.

Wichmann, from his clinical experience, recommends the hypodermic employment of atropine (0.001) in these cases, together with washing out the stomach, cold affusion of the head and neck, followed by friction and artificial respiration.

How to Use Gutta-Percha.

The only safe way to use gutta percha is to heat it over water. Before placing it in the tooth cavity, it is well to smear the walls with a little chloropercha—that is, gutta-percha dissolved in chloroform. Then the stopping will adhere to the walls, and make a more perfect and water-tight filling. See that it is really soft before carrying it to the tooth ; then, with a warm instrument, press it thoroughly to place, and polish quickly. Heating the tooth by a hot blast drawn into your bulb-blower from your lamp helps to manipulate it, and to make the filling stick to the walls of the cavity. If it is a soft variety, it is sometimes well to rub a very little oil or glycerine on your instrument. The red gutta-percha, used sometimes for trial plates, is good for temporary fillings, but the harder varities, if good and properly used, will last a long time.—*Items.*

The Electric Light in Dentistry.

We now have the electric light to aid us in our dental operations, and I find by its use I can now discover imperfections in cavities I have prepared that had previously escaped my attention. Why? Because the electric light gives a paler white light, and it is more intense than daylight. This is particularly so in that form of decay known as the white decay. You may prepare the cavity with the ordinary care, having it seemingly perfectly dry, and a magnifying glass will show you no imperfections, but with the aid of the electric light you find them.—*Dr. Pruyn.*

To get a good polish on mahogany easily: Mix one part of boiled linseed oil with two parts of alcoholic shellac varnish. Shake well before using. Apply in small quantities, with a cloth, and rub the work vigorously until the desired polish is secured.

Anchored Dentures.

The December number of the *Transactions of the Odontochirurgical Society of Scotland*, contains a remarkable paper, read by Dr. Wm. Dall, of Glasgow, on "A Method of Preventing Upper and Lower Dentures from Slipping Forward." His method is to fasten two gold pins to the denture, and have them enter either holes made by drilling into the jaw, or the sockets from which teeth have been extracted. Before drilling he painted the part to be operated on with a 50 per cent. solution of cocaine, and takes care to have the drill thoroughly aseptic. In the case of the lower jaw he drills somewhere between the mental foramen and the symphisis, the upper jaw he says may be drilled at any point, care being taken not to pierce the floor of the antrum. After the holes have been drilled, one on each side, the patient is supplied with an antiseptic mouth-wash and told to return the next day when the holes are thoroughly syringed out. On the third day the impression is taken, with pins inserted in the jaw as in the case of pivots, and the denture is constructed in the ordinary way. The pins do not appear to irritate the tissues, and Dr. Dall says that the first patient upon whom he tried the experiment was a lady from the country, who to this day does not know that the operation was in any way unusual. In the case of pins entering the sockets of extracted teeth his mode of procedure is very simple. The impression is taken the day after the teeth is extracted, and pins are attached to the model in the position they are expected to occupy. They are left as long as possible, as they are apt to set up irritation

and bring about absorption if too short. After the denture has been worn for some time the sockets become filled in about the pins, so that the adaptation is perfect, and in two cases he had been able to supply patients with upper dentures without palate plates. Dr. Dall has drilled ten cases in all, and in fifteen cases has inserted dentures with pins entering the sockets of extracted teeth, and in only one case has there been any suppuration, and that was quickly overcome by syringing with dilute carbolic acid and glycerine.

Power of Mental Impressions.

In 1862 Mr. Woodhouse Braine was called upon to give chloroform to a nervous, hysterical girl for the purpose of having two tumors removed from the scalp. In order to accustom her to breathing through the inhaler before giving her chloroform, he placed it over her face and she at once began to breathe rapidly through it. In half a minute she said, "Oh, I feel it, I feel I am going off." Immediately after she was found to be insensible to pinching and her muscles were flaccid. Both tumors were removed without her having taken a drop of chloroform, and after the operation she declared she had not felt a particle of pain. The doctor very facetiously adds: "To the time she left the hospital she firmly believed in the potency of the anaesthetic which had been administered." ("Influence of the Mind upon the Body," Tuke.)

Chloride of Gold, which has been claimed in certain quarters to be a sure cure for drunkenness, seems, according to a dispatch, to be, in some cases at least, an efficacious remedy for consumption. "Solomon Cheney has had consumption for over two years, and was confined to his bed. A few months ago his physicians asked his permission to experiment upon him with chloride of gold and manganese. He consented, and two drops a day, prepared after the formula of Dr. J. Blake White, of New York, were injected hypodermically. To-day Mr. Cheney is able to be about his house. His step is firm, his appetite is good, the waste of his lungs has been arrested, and the doctors say his full recovery is only a question of time."

A New Use for Gutta-Percha in Surgery.

Dr. B. W. Richardson (*Asclepiad*) has found that gutta-percha, by being softened almost to fluidity in hot water, to which a little glycerin has been added, can be made to take up not only tannin and perchloride of iron, but benzoin, carbolic acid, mercurial salts, and

many other styptic and antiseptic substances. After it is saturated with the substance added to it, it is allowed to cool until it becomes simply a soft mass, that can be moulded into plates, dies, or pellets, which soon become hard and remain efficacious for an indefinite time. When required they are softened by immersion in hot water, and can then be moulded, according to the case, into plugs, splints or coverings of dressings. The mass can also be drawn out, under warmth, into a fine tissue, and used like adhesive plaster, as round a cut finger: where, left to harden, it becomes both plaster and splint. The doctor has tried to saturate the gutta-percha with styptics and antiseptics by dissolving it first in volatile chemical solutions, and then admixing and vaporizing; but he prefers heating it simply in water, or in water with glycerin.

Sheffield's Creme Dentifrice.

R. S. C., Chicago, Ill.—We have no formula for Sheffield's creme dentifrice, but give the following as making a good dental cream somewhat similar. The amount of glycerine of course determines its consistence. If for collapsible tubes it should be made quite soft:

Castile soap, in fine powder, ...	$\frac{1}{2}$ oz.
Prepared chalk, ...	1 oz.
Oil of rose geranium, ...	8 drops
Glycerine, a sufficient quantity.	

Whether oil of rose geranium or some other oil be used as a flavoring is of course a matter of taste. Both wintergreen and peppermint are popular flavors, while spearmint is probably more grateful to many mouths than either.

A pink color may be given to the preparation by the addition of a small quantity of cochineal coloring.

Bergmann's Tooth Paste.

	Parts.
Fine oil soap (castile), ...	50
Sugar, ...	25
Oil af peppermint.	
Alcohol (40 per cent.)	
Anilin red, of each a sufficient quantity.	

Dissolve the soap and sugar in the alcohol by the aid of a gentle heat; add the oil and color and pour out into moulds.

Miss Alice Woodward, of Shelton, Connecticut, who hiccoughed herself to the point of death despite physicians' efforts, is now out of

danger. In consequence of the circulation given the case remedies were sent from all parts of the country. Many were tried, and that suggested by Frank W. Mack, of the Associated Press, New York, was effective. The remedy is nitrate of amyl, a few drops to be inhaled from a handkerchief.

Soap as a Remedy for Mosquito Bites.

Numerous remedies, such as ammonia, oil of cloves, chloroform, etc., have been recommended for mosquito bites, but a writer in the *Kolonialwaaren Zeitung* says that ordinary soap is as good as any of them. He always carries a small piece with him on his country excursions, and in case of a bite makes a lather over the affected part and allows it to dry on. The burning is at once relieved and all pain soon disappears. Should it return, as sometimes happens, it is only necessary to repeat the application.

Soldering of Glass and Porcelain With Metals.

Mr. Cailletet has recently made known to the Societe de Physique a process of soldering glass and porcelain with metals. Mechanists, physicists, and chemists will appreciate the practical importance of this process, which permits of adapting any metallic object whatever (cock, tube, conducting wire, etc.) to experimental apparatus in such a way as to prevent any leakage, even under high pressure.

The process is very simple. The portion of the tube that is to be soldered is first covered with a thin layer of platinum. This deposit is obtained by covering the slightly heated glass, by means of a brush, with very neutral chloride of platinum, mixed with essental oil of chamomile. The oil is slowly evaporated, and, when the white and odoriferous vapors cease to be given off, the temperature is raised to a red heat. The platinum is then reduced and covers the glass tube with a bright layer of metal. On fixing the tube thus metallized, and placed in a bath of sulphate of copper, to the negative pole of a battery of suitable energy, there is deposited upon the platinum a ring of copper, which should be malleable and very adhesive if the operation has been properly performed.

In this state, the glass tube covered with copper can be treated like a gennine metallic tube and be soldered by means of tin to iron, copper, bronze, platinum, and all metals that can be united with tin solder.

The resistance and strength of soldering are very great. Mr. Cailletet has found that a tube of his apparatus for liquefying gases, the

upper extremity of which had been closed by means of an ajutage thus soldered, resists pressures of more than 300 atmospheres. The tube, instead of being platinized, may be silverized by raising the glass covered with nitra of silver up to a heat bordering on red. The silver thus reduced adheres perfectly to the glass, but numerous experiments have caused platinizing to be preferred to silverizing in the majority of cases.—*La Nature.*

Food Before Sleep—Why Some People are Benefited by a Night Lunch.

Some persons, though not actually sick, keep below par in strength and general tone, and I am of the opinion that fasting during the long interval between supper and breakfast, and especially the complete emptiness of the stomach during sleep, adds greatly to the amount of emaciation, sleeplessness and general weakness we so often meet. Physiology teaches that in the body there is a perpetual disintegration of tissue, sleeping or waking; it is therefore logical to believe that the supply of nourishment should be somewhat continuous. As bodily exercise is suspended during sleep, with wear and tear correspondingly diminished, while digestion, assimilation and nutritive activity continue as usual, the food furnished during this period adds more than is destroyed, and increased weight and improved general vigor are the result.

All beings except man are governed by natural instinct, and every being with a stomach, except man, eats before sleep, and even the human infant, guided by the same instinct, drinks frequently day and night, and if its stomach is empty for any prolonged period, it cries long and loud. Digestion requires no interval of rest, and if the amount of food during the twenty-four hours is, in quantity and quality, not beyond the physiological limit, it makes no hurtful difference to the stomach how few or how short are the intervals between eating, but it does make a vast difference in the weak and emaciated one's welfare to have a modicum of food in the stomach during the time of sleep, that, instead of being consumed by bodily action, it may during the interval improve the lowered system.

I am fully satisfied that were the weakly, the emaciated and the sleepless to nightly take a light lunch or meal of simple, nutritious food before going to bed for a prolonged period, nine in ten of them would be thereby lifted into a better standard of health; on the contrary, persons that are too stout or plethoric should follow an opposite course.—*Dr. Cathell in Maryland Medical Journal.*

THE

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TWELFTH PAPER.

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 42, Vol. VI, No. 2.)

THE TREATMENT OF THE TEMPORARY TEETH.

No opportunity should be lost to impress upon patients the utility of the preservation of the temporary teeth. This advice is often thought mercenary by parents, when given by the dentist, but for those whose practice is worth keeping and who are open to reason, it requires no elaborate argument to convince such that it is dictated more through charity than through cupidity. There is scarcely a dentist who hankers after such practice, and all practice of this kind may be set down, more to the dictates of professional duty, than to preference or profit. The reason for the preservation of the temporary teeth should be clearly set forth to the minds of parents, showing them this necessity is both for the benefits that will accrue to the permanent teeth, as well as to save the poor children the tortures of toothache, and the sleepless nights affecting both child and parent, than for pecuniary profit to the dentist. This latter argument, if they do not, or will not see the former, is apt to prevail, either through motives of love for their children or motives for the prevention of personal discomfort.

Children may often be managed better by the dentist than by the parent. As a means of reassuring the excessively timid nothing may be done at the first visit. The picking up of one instrument after another and the *making believe* of a great show of work will tend to reassure them. If the engine has to be used, which is rarely necessary, the handpiece may be armed with an engine polishing brush, and this passed over the teeth. An explanation of all that is done will interest them and make them easy to manage. The recital of a fairy tale, or the relating of a ridiculous adventure, or the present of

a toy will often warm to you with the friendship of Damon and Pythias and secure every co-operation. Other children it is impossible to manage. No argument, no persuasion, no coaxing, nothing will avail. They hide in the skirts of their mother's dresses, and neither promises of coveted pleasures from the parents, or threats of punishment will avail. For such nothing can be done.

Simple cavities in the crown of the upper or lower molars are readily filled. The preparation of such cavities can be made entirely with hand burs, drills and excavators, and such cavities filled with ordinary amalgam, or copper amalgam if it is found impossible to keep the cavities entirely dry. Even if the preparation of such places be not thorough, as to the removal of all decay, we think there is sufficient therapeutic action in amalgam of either kind to overcome the tendency to a recurrence of decay. And should it recur a few years later, the child will be older and more reasonable, so that better work can be done. It is out of the question to apply the dams for a child of four years of age, so that the dryness that may be attained with the napkin is all that can be accomplished. Even should the cavity be moist the introduction of copper amalgam—which can be used very plastic—will answer the purpose. If such cavities can be wiped dry and coated with sandarac varnish before the introduction of the amalgam, it will be of advantage.

FIG. 194.

Where there is a tendency to proximate superficial decay in the upper incisors, these may be widely separated with *fine cut corundum disks running very true in the handpiece of the dental engine*, and cut so as to remove all decay and let the teeth touch near the gum margin or points of contact, as shown in Fig. 194. Should such decay be too deep for an operation of this kind, they may be filled with gutta percha or the phosphate of zinc. If the latter be used it is well to coat the cavities with sandarac varnish; and the approach to such cavities made from the front.

The proximate cavities in temporary molars, when not large, may be filled with gutta percha or amalgam. When excessive, we prefer to use the former, bridging the space from one tooth to the other. This will wear for a long time although chewed upon, and even though

it may be worn, from chewing, to a thin wafer it will still preserve the teeth. Some dentists use amalgam, in the temporary teeth, in this way, but we have never done so, as pink base plate gutta percha has been of great service in cases of this kind with us.

Where the nerves in these teeth have become exposed we prefer to use tannic acid combined with creosote or the oil of cloves for their destruction. Root filling in the temporary teeth is not admissible, but the nerve chamber may be filled with cotton steeped with oil of cloves and tannic acid, after the nerve has been removed from this part of the tooth, and a filling inserted over it; or a hole may be drilled from the buccal surface till it reaches the nerve chamber, when a pin may be inserted. After this, the filling may be inserted and the pin withdrawn so that the hole seems as a vent. If an abscess forms on these teeth and is so painful as to disturb the child's rest, the tooth may be extracted, but once this forms and results in a chronic abscess with an external fistula, it is perhaps better to let such a tooth remain, provided there is no continuance of pain.

Parents should instil cleanliness in their children for the care of their teeth, and the use of the tooth brush taught and insisted on. Waxed floss should be passed between the teeth so as to remove the accumulations of food from these places. It is not so much the eating of candy as the remains of small particles of meat between the teeth that causes the mischief. This cleansing should be done *after each meal* and insisted on. Parents will say that the children fight and will not let them do it. But we say that they fight also to have their faces washed. Will any mother let her child go with a dirty face because of such resistance? Then why have a greater care for the *skin* than for the *teeth*, especially as the latter is equally important? A positive, determined stand on the part of the parent will soon teach the child that he or she must obey.

To clean children's teeth the mother should sit the child on her lap or on a chair, and with a *quill toothpick* remove all particles of food that adhere *between the teeth*, teaching it, at the same time, to rinse out the mouth with water, and how to agitate the water within the mouth, by churning it around, by the action of the muscles of the cheeks. A piece of waxed floss silk should also be used, passing this between each tooth both in the upper and lower jaws If the mother does not know how to do this, she should be instructed by the dentist. After careful picking with the quill toothpick, and the free use of the floss silk, the child should rinse the mouth with water, and then taught how to brush the teeth with the tooth brush; not merely brushing

them across from side to side, but brushing the *upper* teeth *down* and the *lower* teeth *up*, so as to be sure that the bristles of the brush enter the spaces *between the teeth.* A good plan also is to put a teaspoonful of "Listerine" in a quarter tumbler of water, and empty this into "an atomizer" and spray all the teeth, upper and lower, inside and outside thoroughly. Five minutes given to this after each meal will tend greatly to the preservation of the teeth, and the prevention of many cases of *proximate decay*; which is the decay most difficult for the dentist to combat, for children particularly. A habit of cleanliness like this once inculcated by the parent, remains so fixed with the child, and is productive of such pleasant feelings, that what was once irksome to both becomes a pleasant duty, which is looked forward to by the child, and which becomes a great privation, when, from any cause or circumstance, it cannot be indulged or performed.

The habit too of sending the child periodically to the dentist for dental examination is one to which all parents should attend, both because it is for the child's benefit as also because it disarms their minds of the fear incident to such visits.

If the temporary teeth exhibits early signs of being prone to decay, their proximate surfaces may be separated by wide V shaped spaces. This may be done even in anticipation of decay. This should be carefully done so as not to destroy the *natural point of contact*, otherwise the operation becomes more a help than than a hindrance to decay, and will also be a great source of discomfort to the child by the impaction of food between the teeth. Even if this be not done, the dentist cannot err to dress off the distal faces of the second temporary molars when the first permanent molars are observed to be taking their places in the jaw, so as to prevent the mesial surface of this latter tooth from decay.

REPLANATION.

By replanation we understand the returning of the same tooth in the same socket, when this has been removed by accident, or extracted for chronic inflammation, or abscess. The operation may be readily performed, and is ordinarily successful; especially so when the teeth have been dislodged by accident. In cases where they have been extracted for persistent or chronic abscess, with the effect for the cure of the same, the tooth is well washed in warm water in which a drop or two of carbolic acid may be dissolved. So much of the diseased peridental membrane which has thickened at the end of the root is cut off or scraped. The foramen at the end of the root is enlarged and this is then filled with gold and afterwards made perfectly

smooth. If the root canal has not been filled, this should be done, either through the cavity of decay or through any opening which may be made in the tooth offering the most facility for its performance. The alveolus is then well syringed out with a stream of tepid water from the dental syringe and every clot of blood adhering to the walls of the socket carefully removed. The tooth may be permitted to soak in a solution of bi-chloride of mercury 1-2000 in tepid water and when all bleeding has ceased in the socket it may be returned to its place. It can be retained "in situ" by means of ligatures attached to adjoining teeth, or a splint formed of red base plate gutta percha, which has been softened over a water bath, may be so pressed over it and over a tooth on either side of it, and attached by ligatures to the neighboring teeth, may be so arranged until an attachment is set up between the periosteum of the alveolus and the membrane covering the root. The latter plan is sometimes best as it prevents the tooth being bitten on, until this union takes place. All of the single rooted may be replanted and sometimes the second upper bicuspids. In the first upper bicuspids there is frequently two distinct roots, or a divergence near the end, which precludes the re-insertion of these teeth in their sockets, unless such divergence of their roots be entirely amputated.

TRANSPLANTATION.

By transplantation is understood the insertion of a foreign tooth into the alveolus of an extracted one. Like replantation it may be practiced only with the single rooted teeth. The operation is attended with certain danger; because if the person from whom the tooth is removed to be transplanted into another's mouth, be unhealthy, particularly be tainted with syphilis, the disease will be transmitted. There are many considerations to be taken in the performance of this operation. The tooth must be of the same size, side, curvature, &c., and the root must also be the same size, certainly no larger. Its root should be rather smaller: if longer it may be amputated to admit of its entering the socket, but it must not be larger in diameter, otherwise it will not do. This point of course cannot be determined but by trial. The transplanted tooth is held in position by ligatures or splints, until a union makes them firm in the socket. Teeth that have long been extracted, may be transplanted, if such be kept in carbolic acid and water solution. But the history of the tooth to be thus used, should be thoroughly known for fear of transmitting disease.

IMPLANTATION.

By this operation the formation of a new socket in the solid bone is made with cutting instruments, (manufactured for this special purpose) and a tooth suitable for the case inserted into the socket thus formed. The gum covering the bone is first removed by a cutting tool used in the dental engine. This is the most painful part of the operation. Hydro-chlorate of cocaine is injected into the gum tissue where this cutting is to be made; after which the artificial socket is drilled into the bone. This is first begun with a spear shaped drill in the dental engine, and carried as deep as need be. The socket is afterwards enlarged and shaped to admit the root of the tooth to be implanted. The tooth, and all the instruments used are thoroughly disinfected by the use of hydro-napthol or bi-chloride of mercury, and the hands of the operator are likewise thoroughly disinfected with suitable antiseptic washes, lotions and soaps. These teeth are held in place by ligatures the same as in the other cases related above,

Implanted teeth become very firm in the sockets thus made for them. It has been thought that this is due to the fact that the artificial socket is unlike a natural one, in not being furnished with a periosteum, so that the teeth are retained by *anchylosis* and not by gomphosis. The operation is of two recent origin to speak of it with any certainty of results.

[TO BE CONTINUED.]

CRITICISM ON QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

EDITOR OF DENTAL OFFICE AND LABORATORY:

A teacher should be correct in his teaching. To teach imperfectly, is to mislead and confuse. A dental student wrongly instructed, is like a mariner with defective compass, and his whole future course may be amid rocks and shoals.

I was reminded of this truism by reading " Questions and answers for dental students " in the January number of DENTAL OFFICE AND LABORATORY. On page 15 is the following:

Q. How do caries first indicate its presence?

A. By an opaque spot; a whitish chalky appearance beneath the enamel, or a dark brown, bluish, or black indication.

Q. Does decay begin from within and proceed outwardly or the reverse?

A. It always begins outwardly in the dentine beneath the enamel

Q. How can it do this, since the crown of the tooth is covered with enamel?

A. Generally through some crack, fissure, abrasion sulcus or some otherwise imperfect points in the enamel."

Here the student is plainly taught that "decay *always* begins outwardly in the *dentine beneath the enamel.*" And when the very natural query is made, "How can it do this, since the crown of the tooth is covered with enamel?" the seeker after knowledge is calmly informed that the aforesaid decay *commences* in the *dentine* by means of "cracks, fissures, etc., in the enamel."

This is a good illustration of the old, old story, of telling the second fib to cover the first.

First. Decay *never commences beneath the enamel.*

Secondly. Decay does not, as a rule, reach the dentine through "cracks, fissures, etc.," of the enamel.

As proof of the first statement is the fact that decay can *always* be removed when *superficial*, or before it has penetrated *through* the enamel; and there must, of course, be a time in *every case* when the decay *is* superficial. And this superficial decay is being removed every day, with the result of leaving smooth, polished, sound *enamel over dentine.* Is it not obvious that if decay first commenced *within* or in the dentine, this could not be done without leaving the dentine exposed?

Thirdly. Decay does not, as a rule, reach the dentine through "cracks, fissures, etc." The exceptions to the rule are to be found on the coronal surfaces of the molars and bicuspids, and the palated surfaces of the superior incisors. In these cases, even, the decay *commences in* the "cracks, fissures, etc.," and penetrates slowly *through* the enamel to the dentine; and in every instance in its *incipient* stage, save that of a deep crack, which is seldom seen, it can be removed. But in the large majority of cases, decay commences on the proximate surfaces, which are smooth and free from "cracks, fissures, etc" We are all familiar with the causes of this decay, and we also know that they are *without*, and not *within* the teeth. It does not follow, because the enamel is crushed and breaks down, exposing a cavity beneath, that the disintegration commenced in the dentine. It is a common occurrence to discover on the proximate and other surfaces, enamel in which a fine pointed instrument will find no cavity; but a little force will put the instrument through the honey-combed enamel into the soft dentine or cavern beyond. The mischief in this case was once *superficial* and on the *surface.*

Again, an "opaque spot" is not, necessarily, decay of enamel or dentine. Such spots are seen on teeth of every color, texture and age. They are usually on or near the cusps of molars and bicuspids, and near the cutting edge of the other teeth, and are generally conceded to be the result of imperfect development, or abscessed first teeth. They seldom progress to caries, and many such spots I have watched for twenty years or more.

In the article on extraction in the same number of DENTAL OFFICE AND LABORATORY, are several rules given for the guidance of beginners, that possibly may apply to Philadelphia extracting, but which would not be quite right for New England. The position of the operator in "front of the patient" in extracting right lower molars, is faulty, and a handicap to both. A very difficult operation can not be performed in that position. One objection to such a position is, the operator stands directly in his own light, which is often a very important factor; and secondly, the operator cannot possibly apply the force in such a position that he can apply when standing directly behind and above the patient. Were it not for the suffering which the poor patient would have to endure, it would give me pleasure to send to Dr. Chupein a typical case, a New England farmer, or outdoor laborer, about forty years old, with an aching right lower molar, firm in the socket, as such teeth generally are when they *first* ache. It will not do to say that such teeth should not be extracted. We all admit that it seldom should be done, and yet we all have to do it again and again. Many people are too busy, or think they are, to give any time to the care of their teeth. To remove such a tooth as I have named, as quickly and easily as possible, the operator should stand behind and above the patient, with the patient's head slightly turned to the right; and while the operator's left hand firmly grasps the lower jaw, (which should always be done, and which cannot be done while the operator stands in *front* of the patient") his right hand, arm and body are in position to apply the necessary force, and in any direction required. And concerning the forceps for such a case, there is a much better instrument than the cow-horn forceps. They are practically a combination of the cow-horn and Harris forceps, or cuts 173 and 175 in Dr. Chupein's article. The beaks are long and narrow for half their length, while above they are of the usual width, and smooth on the inner surface. With such an instrument, many teeth can be loosened by pushing down and closing on the tooth at the same time, with a little lateral movement; and there

is no danger of the tooth "snapping" into the throat as with cow-horn forceps.

In a corner of my instrument case, I have the old turnkey, and cow-horn forceps; and they are shelved as curiosities.

A. T. SEVERANCE.

The doctor is right when he says that a teacher should be correct in his teachings, and we propose, without entering a controversy to answer his strictures.

He objects first to the manner in which caries indicate its presence. We say by an opaque spot, a whitish chalky appearance beneath the enamel, or a dark brown, bluish or black indication.

He would have to take more eminent men than ourselves to task for such teachings when we refer him to that "Father of Dentistry" Chapin A. Harris, who says:

"Its presence is usually indicated by an *opaque or dark spot* on the enamel, and if this be removed, the subjacent dentine will exhibit a *black, dark-brown* or *whitish* appearance. *It usually commences on the outer surface of the dentine* of the crown *beneath the enamel*, at some point where it (the enamel) is imperfect, or has been fractured or otherwise injured; from thence it proceeds towards the center of the tooth, increasing in circumference until it reaches the pulp cavity."

"If the diseased part is of soft and humid character, the enamel after a time breaks in, disclosing the ravages the disease has made on the subjacent dentine. But this does not always happen; the form of the tooth sometimes remains nearly perfect until its whole interior structure is destroyed."

"The enamel is much harder than the dentine, and is by far less easily acted on by the causes which produce caries."

"Commencing externally beneath the enamel, the disease proceeds, as before stated, towards the center of the tooth, destroying layer after layer, until it reaches the lining membrane, leaving each outer stratum, softer and of a darker color than the subjacent one."

"When the enamel is first attacked, it is usually called *erosion;* but as this tissue (the enamel) does not contain so much animal matter as the subjacent dentine, the diseased part is often washed away by the saliva of the mouth; while the dentinal part of the tooth, it, in most instances, remains, and may be removed in distinct laminæ, after the earthy salts have been decomposed."

Professor Gorgas says:

"It usually commences on the outer surface of the dentine under

the enamel. . . . . The occurrence of the disease is ordinarily first indicated by an opaque or dark spot on the enamel."

Thus in our refutations, when only examining this subject in a cursory manner we have brought forward the testimony of two acknowledged authorities.

In our own examination and experience of this subject we would say, that we have met teeth that exhibited *no outward sign of decay.* The finest pointed probe would sink scarcely the one thirty-second of an inch into a sulcus, fissure or crack in the enamel, and when this was opened, the decay of the dentine beneath, was so extensive that the pulp was nearly laid bare. On the other hand we have noticed a lightish-brown discoloration *in the enamel*, generally on the proximate surfaces, or at the point of contact, in two teeth or following the gum margins, which when scraped showed the effect of the disintegration of that tissue, and in such cases the decay of the dentine was incipient, and had not penetrated to any considerable depth into the dentine.

The spots spoken of by Dr. Severance are not decayed spots. Every dentist of any observation has noticed these and knows that it is not decay. These spots are produced by a lack of nutrition during tooth development, and doubtless is the result of such infantile diseases as whooping cough, measles, scarlet fever, &c., &c.

Therefore we hold that we make good our words in the "Questions and Answers for Dental Students" by adducing authority for the support of what we have said that is beyond cavil, and the cases to which we have referred are answered, by the answer "*Generally through some crack, fissure, abrasion, sulcus or some otherwise imperfect point in the enamel.*"

Nevertheless we find Dr. Severance's points well taken, and are reconcilable to common sense and to fair impartial judgment.

We desire to disclaim any such idea as holding ourselves up as "a teacher." Our aim and sole object, in what we have written, solely having been to smooth the path of the student and to aid him in his efforts at study. We have too much to learn ourselves to aspire to the dignity of a teacher.

In reference to Dr. Severance's strictures on extraction of the teeth, we would say that we do not give our manner as infallible or as not amenable to improvement, but only as the results of our own personal experience. The relegation of the "cow-horn forceps as shelved curiosities" is, we think, a little "too too," or going in advance of the age since this instrument is constructed on the most

correct mechanical principles. But "Exter" is much nearer "The Hub" than "Philadelphia," and consequently Philadelphia does not derive the effulgence of that "Luminary of Learning" that Exter does.—Ed.

SOME POINTS UPON REGULATING AND REGULATING APPLIANCES.

[Paper read before the Pennsylvania Association of Dental Surgeons by Howard E. Roberts, D. D. S., Philada.]

Mr President and Gentlemen: The majority of dentists, I believe, shrink from or hesitate about undertaking a case of regulating, and wish some other one had the work to do.

The reasons why such a feeling exists comes from various causes, some of which are—that they cannot get enough for the case to pay them for the time and trouble: that the patient is apt to get discouraged and cannot be controlled, while the appliances are liable to get out of place, making a very sore mouth and doing that which was not intended; that it is almost impossible to tell how long it is going to take, and while they may know what they want to accomplish they don't see just how it is to be done, or what is the best way of doing it.

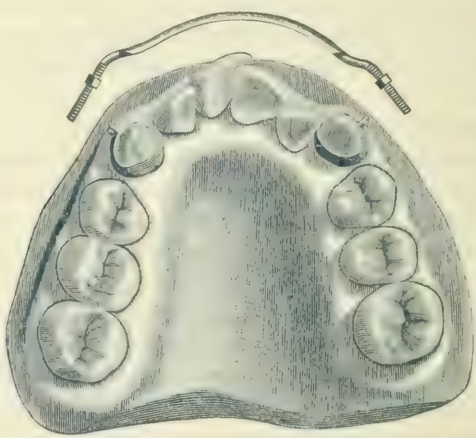
My object in writing this paper is to try to give some points which may help those who are disgusted with regulating, and which may make their work a little easier, some points which I have learned from experience.

I have corrected irregularities of the teeth for patients between the ages of 8 and 40 years, and prefer my patients to be from 14 to 20 years old. Under 14, it is difficult to get the patient to take an interest in the case, and give you their assistance and co operation, which is almost essential to the successful completion of a case of any difficulty.

As a rule it is better that the patient should have lost all the temporary teeth with the permanent ones well developed, particularly the canines. The patient should want to have their teeth straightened, and nearly every patient needs some education upon regulating. Try to tell your patient about what they must expect in regards to pain, and never promise to be through by a given time; if you give a guess make a long one and then double it. The patient is apt to get discouraged if you are not through by the time stated.

No matter how simple and easy the case, make and adjust the appliance carefully, and be sure it will do the work, a great deal of extra work is made by thinking the case is too easy, and will give no trouble.

With a case which presents many difficulties, don't be in too big a hurry to begin work, take your casts and think it out. It is very difficult for any one to tell how or what would be the best way to treat a case from looking at the casts without seeing and knowing the patient, as so much depends upon them. I have asked of those whom I thought knew, to try to get information upon some regulating cases and have been much disappointed because they told me little or nothing. There is one class of appliances which have given me more trouble than all others, and yet one of the most largely used; it is the rubber plate in the roof of the mouth, with the screws and springs, which may be attached thereto. It is difficult to keep the plate securely in place, and I seldom use it where anything else will answer. A great deal can be done with a rubber band if you can keep it in place, and the most satisfactory way which I have found to keep it there is by cementing metalic bands around the teeth, they may be plain or have either hooks or eyelets upon them for attaching the rubber. A band with an eyelet is made in a few minutes at the chair by taking a piece of platinum as wide as you want the band, and long enough to go about $1\frac{1}{2}$ times around the tooth and of about 32 gauge.



Put the strip around the tooth with the ends projecting out, with a pair of flat pliers, the jaws of which are smooth, pinch the ends together flat, the jaws of the pliers being pressed firmly against the tooth, very much as I believe Dr. Herbst makes his band matrix. Take the band off the tooth and cut off one of the ends about 1-16 inch from the band and lap the other end over it and pinch the parts together, and solder over the alcohol lamp with gold, when you will

have a band which will fit the tooth having a projection on one side. through which drill a hole, and file smooth for an eyelet or bend it over and make a hook.

A very satisfactory and comfortable arrangement for moving any or all of the six front teeth either in or out, is made by cementing eyelet bands to the canines, then out of half round platanized gold wire make a bow and bend to about the curve which you want the teeth to come to when in place.

File the ends of the bow square, and run a thread upon them, so they will pass freely through the eyelets in the bands, make a nut out of heavy gold plate to fit the screw thread on the bow. You can make a tap for the nuts out of an old excavator, by drawing the temper and filing square with a long taper, and running a thread upon it, with which you can tap a hole drilled in gold plate, from which make the nut. The eyelet must be so made that the nuts can be easily turned when the bow is in place, the nuts are placed either in front or back of the eyelet, depending how the teeth are to be moved.

In using this arrangement, they are left loose until the bow is firmly tied to the teeth, when they are tightened up. You use the spring of the bow, and the patient can help a great deal in keeping the nuts tight with a little wrench or key. When the bow is in place it should rest across the centre of the front tooth or nearer the gum, and under no circumstance should it draw away from the gum or have to be sprung up in tying, or you will elongate the tooth. I know of no way by which a tooth can be elongated easier than by such an arrangement. The jaws can also be expanded as far back as the molars. I have had more satisfaction for myself and comfort for

my patient with this arrangement, and found it applicable to more cases than anything I have yet seen.

It is not a universal appliance, but any one who will try it will be surprised to find how much can be done with it, and how many cases it will answer for.

If the bands are cemented to either or both the bicuspids it may be difficult to keep the bow in position over the incisors, in which case make a band to fit the most prominent tooth, and instead o1 drilling a hole, file a notch in the projection on the band in which the bow will rest, and being tied down will be held firmly in place. In a great many cases there is more pain caused by the appliances getting out of place than in moving the teeth. Bands or ligatures getting under or pressing on the gums causing a soreness and irritation which is exceedingly hard for the patient to bear. With this arrangement there is no difficulty in keeping the mouth in a healthy condition.

These are casts of a case where nothing else was used, and corrected as far as I cared to go at the time in less than three months, most of it was done in six weeks. The patient lived about 100 miles out of the city. Frequently, when you want an attachment to a back tooth you will find a cavity or filling in which you can cement a pin or hook, or use crown cavities in the molars, and connect them with a bridge cemented in the cavities with hooks coming over the side of the forward tooth between the cusps, making a T shaped piece with the ends bent over the side of the tooth. Any appliance placed upon the front teeth and taking all the force of the bite, the molars not coming in contact, and worn for some time, will either enlarge the angle of the jaw or cause the molars to elongate, consequently opening the bite of the front teeth, a thing to be avoided and hard to correct if it is not desired. A band should not be left around a tooth for any time without being cemented, owing to the danger of decay.

An appliance which the patient can take out to clean and put back again, is apt to require frequent cleaning by the patient. But if it can be kept clean by a brush while in place and is cemented firmly to the teeth, it will generally be found in position. A rubber band should never be allowed to rest against the gum with a continued pressure, and should invariably be tied so it is impossible for it to slip under the gum. Every one must set his own fees, but the most satisfactory way which I have found in regulating is to keep a record of all time spent both in the laboratory and at the chair, and charge by the hour, letting it be so understood by the patient before starting

work, and if you guess how much it will cost, make a large one, and come within it if possible. The case I have shown you took 29 hours. I have written this in the hope of assisting some who avoid regulating cases, and not with a view of instructing those who have had more experience in such work than myself.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of this society, held on the evening of February 8th, Dr. D. V. Beacock, of Brockville, Canada, addressed the subjoined letter to the Secretary, and presented appliance (which is here illustrated), which was warmly approved for its neatness and efficacy.

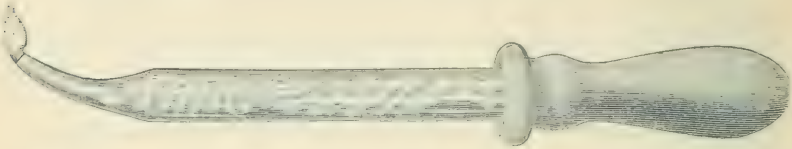
Dr. T. F. Chupein :

Dear Doctor :—I notice illustrated in the last issue of the D. O. & L., a handy little vial lamp for heating purposes, designed by Dr. N. H. Keyser, and presented by Dr. Trueman. Allow me to draw your attention to a small but very efficient article that I have been using for some time. It has given me the greatest satisfaction. To avoid describing it to you, I have mailed you one complete, ready to light and use in the mouth. If you could show it to Dr. Truman, I think he will be quite pleased with its use. It is so much more convenient to handle in any part of the mouth, the flame can be flashed on to any tooth. It is always ready to light, if the end is kept covered with the rubber tubing to prevent evaporation of the alcohol. To refill slip off the rubber bulb, fill the bulb with alcohol and replace. Any dentist can make one at a cost of only five cents, and it is worth a dozen of the clumsy Southworth flash lamps sold at $2.00 each. It is small, neat and always ready for use ; the bulb holds sufficient alcohol for every purpose ; only takes a minute to refill when burnt out. The slightest pressure on the bulb is all that is necessary to force the alcohol into the wick, or flash the flame and increase the size. Note—The bulb should never be pressed so hard as to force out the alcohol, as it will take fire and burn outside the tube.

I think you will like it when you try it and see how easily it works, etc.

I might mention that the wick should be small enough to let the alcohol flow freely, otherwise the wick will char, and not burn so freely or make as hot a flame. It should project from the tenth to the eighth of an inch. I find the readiest way to fill it is to press the bulb and insert the point into the alcohol and let it fill. The alcohol will pass the wick readily. I keep it standing in a tumbler, bulb downward, so it is ready to be ignited at once, and can be put

back in the tumbler, and kept burning until again wanted, provided it has to be used two or three times. This I found was better than relighting each time it was wanted. If the end of the glass tube could be tipped with metal, I think it would be an improvement. I bend the end of the glass tube to any curve that my fancy suggests, by simply holding it in the flame of a spirit lamp.



When using it on the teeth of the lower jaw, the alcohol should be pretty well pressed out, until it ceases to drop from the nozzle; when the lamp is lighted and the flame flashed or blown downwards, there is no alcohol to drop down in the end of the tube and take fire. Of course this cannot happen when using it on on the upper teeth. The wick will hold sufficient alcohol to heat any tooth without any excess of it in the tube. As the flame has a tendency to burn upwards it can only be used in a lower tooth successfully by flashing or pressing the bulb and forcing it in spurts. This cannot be done, without danger, if the tube is full, as when used for upper cases.

Yours, etc., D. V. BEACOCK.

Dr. William H. Trueman believed that porosity of vulcanized rubber was caused—First. By a too rapid application of heat causing the gases generated during vulcanization to be given off too rapidly and too freely. The less mineral matter contained in the vulcanizable gum the more liable it is to become porous. Black rubber will become porous under conditions that will not in the slightest degree effect the light pink rubber. The greater the mass of the rubber the greater care required in raising the heat from 260° to the vulcanizing point.

Second,—Rubber will become porous if the heat is carried too high, without regard to its mass, and with but little regard to its composition.

There is a vast difference between dry steam and wet steam, vastly more than between vulcanizing under water and over water. The Seabury vulcanizes at one hundred and twenty pounds, corresponding to a temperature of over 340 degrees in one hour, the same time and temperature in a Whitney would ruin the work.

He said that he had made two cubes of black rubbers, each cube

made of two sheets of rubber which were about $1\frac{1}{4}$ inch square. Each cube was placed into a new brass flask, invested with plaster and firmly bolted down. One flask was placed into a "Whitney" vulcanizer, and the other in a "Seabury." Both were prevented from being in direct contact with the bottom of the pot by the interposition of a casting ring. They were vulcanized in the manner that the process is usually conducted, consideration being taken for the thickness of the sample. When finished it was found that the cube in the "Whitney" vulcanizer was completely porous. The rubber had bent the top of the flask, and had exuded through, so as to fill the entire vulcanizer's pot, into a large, black, porous, charred mass, the plaster of investment being entirely driven out of the flask, and scarcely discoverable. The cube in the "Seabury" had not perceptably changed in size or shape. The investing plaster and the flask were uninjured; the outer portion of the mass of rubber, from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in thickness was solid; the inner portion was porous. Over one hour was taken in raising the temperature of the Whitney vulcanizer from 260 to 320. The "Seabury" was previously heated with steam at 120 pounds. The flask was then placed in the dry steam compartment. The steam immediately admitted, and the full vulcanizing temperature obtained, within a few minutes—probably not more than three. It must be remembered, however, that some time would elapse before the heat would penetrate the contents of the flask. This experiment illustrates one great advantage of dry steam vulcanization. Porosity of rubber, due to evolution of gases during vulcanizing must not be confounded with air bubbles occasionally found in a vulcanite plate—due to imperfect packing or to some fault in its manufacture before it comes into the dentist's hands. The sulphuretted hydrogen freely liberated as soon as the porus portion is cut into, indicates, beyond question, the first mentioned condition.

CONCERNING "BLACK-JOINTS" IN ARTIFICIAL DENTURES.

W. H. NEALL, D. D. S.

The great "bug-bear" of the worker in dentistry is that of "black-joints." A case may be absolutely perfect in every respect, but if an unsightly line of demarcation makes itself manifest between blocks, the dentists ire is aroused, and the patient's criticism excited. I strongly maintain that every case can be turned from the vulcanizer with as clean joints as when first fitted, no matter whether the fitting is close outside and wide inside, or vice versa. The one exception to

this is that of a denture that as been worn for some time. Secretions will work in and around blocks no matter how closely fitted they may be, and this material in vulcanizing often becomes dark; but for a new case to be so marred, there is no excuse. In the first place *absolute cleanliness* in flasks, bolts, interior of copper boiler, plaster and the *hands* must be observed. The reprehensible practice some have of keeping bolts in oil, or thickly covering them with oil, is to be condemned, for, whilst vulcanizing, this grease in combination with the iron rust of the flask, penetrates the plaster and discolors the material used for closing the joints. Bolts should be oiled but afterwards wiped dry. If your plaster shows dark and is ill-smelling, after vulcanizing, there is something wrong: either the flasks and bolts were not clean or the copper boiler was coated with an oily deposit. A case should never be left in a vulcanizer, or even in a flask over three hours after vulcanization.

After the set of teeth has been waxed up, and, in waxing up, the wax or spatula must *not* touch the joints, it is placed in the lower half of the flask in the usual way, and after the plaster has hardened it is trimmed and varnished; but before the top part of the flask is put on, and the plaster poured, the following precaution must be taken: Hold the teeth in a bowl of water for a few seconds, so that the water will penetrate the joints, then wipe off the varnished plaster and pour your remaining investing material. The thin plaster will find the way, guided by the water, between the blocks, and the *outside* is thus protected from rubber forcing there. After the plaster has hardened, separate the flask by immersing it in *boiling* water, until it is thoroughly heated. Vents must now be cut at every joint, directly from the gum part of the block. Other vents occur between these main ones, and, at the heel of the plate, as many as five or six may be cut with profit. After the main particles of wax have been removed by the pick, pour *boiling* water into the case until every vestige of wax is removed, then drain the case for a few *seconds* and proceed to flow *thin* plaster into the inside joints before all the water has evaporated; let this plaster harden thoroughly. The plaster should be led into the joints by means of a piece of soft wire hammered to a flat thin point. After trimming away the excess of plaster at joints, begin the packing, and use just *the right quantity of rubber*. The great evil is in using too much rubber and expecting the vents to relieve your uncertain mode of operation. To one who is accustomed to the working of rubber, the *exact quantity* needed for each case becomes "second nature," and requires measurement neither by

weight nor by the displacement of water in the rubber gauge, the eye being a sufficient guide. But as we write to prevent "Dark Joints," and know this can be done every time with certainty—provided of course the joints are properly ground and well-fitted—we will say: collect every particle of wax from the case, make it into a ball and put it into the rubber gauge. Note the level of the water in the gauge. Remove the ball of wax, and put small pieces of rubber in the gauge until the water rises to the exact level it did when the ball of wax was in the gauge. This will be the exact quantity needed; but an extra piece, about the size of the first joint of the index finger, is generally added for security that enough has been employed. In packing, it is well to pack by using small pieces around the pins, and by laying a strip over each joint. Do not have any excess pressing against the blocks—especially if these have been ground thin—for fear of fracture. The excess should rather be along the *median line*, so that the rubber will be pressed in proper quantity towards the block sections.

Some dentists use neither the gauge nor weights to determine the quantity of rubber needed, but pack the mould full, and then place a piece of cloth between the two sections of the flask. Then boil the case, and when the rubber is thus softened they screw down the bolts to the full extent. The sections of the flask are then removed, by unscrewing the bolts, and by examination they determine if too little or too much rubber has been used. If the former, more is added; if the latter, the excess is trimmed off with small curved blade scissors. I strongly condemn this plan. I maintain that dirt or grease may get in by separating the sections of the flask, or the work otherwise injured by such a procedure. By care in every detail herein expressed, a sufficient quantity of rubber can *always* be secured. If a plate is over-loaded look out for cracked blocks, discolored joints, and a thick, clumsy denture. After placing the flask together and adjusting the bolts, boil it in water for four or five minutes, as hard as it will boil, then screw together. The case must now be vulcanized at a medium heat; the higher the heat the harder and darker the rubber. If the case is then removed as directed, and *hands* and *tools* and *utensils* have been kept *perfectly clean*, a black joint will never appear. The above directions may tally with what thousands "think they do," but if examined closely they will find slight differences, and in these differences the success lies.

A HINT.

By Theodore F. Chupein, D. D. S., Phila., Pa.

We sometimes, in our efforts to make use of roots for crowning find

these so covered with gum tissue that they are not seen, and only known to be present by the indications which point to the presence of a root. In some cases we snip off the overlying gum with the sharp pointed curved blade scissors. When the gum has ceased to bleed, we pack base plate gutta percha, depending on the teeth being narrower at the necks to hold this in place. At the next visit the root can be distinctly seen but is not in a condition yet, to bend a ferule or band around it. Our next procedure is to wrap ligature silk or gilling thread two or three times around the root, and then push this down well on the gum around the root and tie firmly, and hold it in place by replacing the pink gutta percha, wedging it, as before, between the adjoining teeth. At the next visit, the root is so clearly marked and the gum so well pushed away from it that there will be not the least difficulty in preparing the root or fitting the ferule accurately, and this without the least wounding of the gum. It may happen that at first the gilling twine cannot be wrapped around the root but *once*, and at the next visit but *twice*, but by perseverance in this way, the root can be so thoroughly exposed and the gum so well pushed away that it becomes a pleasure to the operator to fit the ferule and no pain to the patient while he is doing this.

OBITUARY.

The following resolution was passed at the last meeting of the Board of Directors of the Philadelphia Dental Society:

Whereas, It has pleased our Heavenly Father to call to rest Dr. Charles A. Kingsbury, our friend, associate, active member, and one of the Founders of this Society; therefore, be it

Resolved, That we desire to express our high esteem for one whose faithful and earnest work is widely known throughout the profession; and

Resolved, That this record of our deep regret be entered upon the minutes of this Society, and a copy of these resolutions be sent to the dental journals for publication.

L. Ashley Faught, *Secretary.*

BOOK NOTICES.

Catching's Compendium of Practical Dentistry for 1891. B. H. Catching, D.D.S., Editor and Publisher, Atlanta, Georgia.

We have naught but praise for this work. It is so full of good things, so replete with practical suggestions, and all so briefly to the point, that it is a book well to have always at hand for consultation.

We recommend it to all practicing dentists and feel sure none will regret its cost ($2.60 by registered mail) for the many useful hints contained between its covers.—Ed.

Chart of Typical Forms of Constitutional Irregularities of the Teeth. By Eugene S. Talbot, M.D., D.D.S., Professor of Dental Surgery, Woman's Medical College, Lecturer on Dental Surgery and Pathology, Rush Medical College, Chicago: Author of "The Irregularities of the Teeth and their Treatment;" &c., &c. Published by the Wilmington Dental Manufacturing Company, Philadelphia, 1891.

This work is in the form of an Atlas—illustrating the various forms of constitutional irregularities, which is not due to accident but to the deviations of normal development. The cuts are of life size, some larger, exhibiting the various closures or occlusions of the teeth, such as are met in the various forms of irregularity, by the dental surgeon. The work contains eight plates of these occlusion clearly and beautifully illustrated, as also eight other plates, printed in colors showing "The V shaped arch," "The saddle shaped arch" and their variations.

The work is handsomely gotten up, well executed, well printed on fine paper, and is a valuable aid to the specialist in Orthodontia.—Ed.

We have received from their author, Isaac B. Davenport, M.D., M.D.S., 80 Avenue de l'Opera, Paris, France; Honorary Member of the New York Odontological Society, Member of the American Dental Association, Membre de Societe Odontologique de France, &c., &c., the reprints of three articles on dental subjects which will pay and interest any member of the Dental Profession to read and study, viz.: "Non-Cohesive half cylinder and Loop filling," "Harmony and Discord, Health and Disease, Healing and Hindering" and "Articulation of the Teeth."—Ed.

TREATMENT OF PULPLESS TEETH.

M. H. Fletcher.

The late experiments of Prof. Miller have put us in the way of treating such teeth more intelligently, for the reason that we now have some facts as to what kind of germs we are dealing with. We do not question but that they have already been successfully treated by the intelligent practitioner, yet we have not been treating these

conditions with a specific idea of the kind of life we are trying to destroy. I venture to suggest a plan (not entirely new) by which both patient and operator be saved time and annoyance. The theory is first, that gas forming bacteria must be gotten rid of before these cases can be successfully disposed of, and that this condition can most quickly and conveniently be accomplished by the use of arsenious acid, or other strong germicides. I first venture the statement that there is no lesion of the tissues of the body (not self-limited) more amenable to treatment than the one in question. This is proved by the many and various kinds of treatment suggested and practiced. Many operators go so far as to say that they never lose a case. While they believe this to be true it is probable safer to say their loss is exceedingly small. Now, if it be so simple a process to treat these cases successfully, it should also be a short process.

Dr. Geo. Cunningham, of Cambridge, England, gave three years ago, a paper and statistics on the treatment of such teeth with arsenious acid. He says of their curability: "The success of the operations seems mainly to depend on the old axiom, 'The cause being removed the effect ceases.' No observant operator can have failed to notice the inherent curability of abscessed teeth.

Who has not noticed the frequency of cicatricial tissue marking the existence of former fistulous tracts, even where the putrefactive contents had been allowed to remain? It is to this inherent property of spontaneous curability that we look for the relief and cure of all the injurious conditions arising from a putrescently diseased pulp."

Cunningham designates the arsenical treatment as the "Immediate method," and the other and longer processes he calls the "Dressing method."

We do not claim originality in what we wish to present, except possibly the formula used, and the manner of its use. Dr. Cunningham gives the following:

Arsenious acid..
Alcohol.................. ....
Oil of clover..

He reports a loss of only 3 teeth out of 512 treated.

Our own formular is,

Arsenious acid..
Precipitated chalk.................. ....
Glycerine sufficient to make a thick paste.

(Arsenic is only slightly soluble in water, 1 part dissolving in about 50 of water, and slightly more soluble in glycerine, so that

only small portions of arsenic would be carried to the pulp chamber. No chemical union results from the mixture of arsenic with the chalk.)

The latter formula I consider better because it is more easily manipulated, and in consequence is less dangerous to surrounding tissue: 1. Because the quantity is small by its admixture with chalk. 2. Because the quantity is easily measured by the eye, and being in a somewhat solid form is not likely to be forced through the apical foramen as a fluid might, while yet there is present an ample quantity to be a most thorough germicide. The dose of arsenic is from 1-20 to $\frac{1}{4}$ of a grain: the stomach of an adult readily takes up this quantity. But in the use as we recommend there is probably not applied in any case more than 1·40 of a grain, and this not in contact with soft tissue at any place unless it be forced through the foramen, and should this occur and there be a pus sack the 1·30 or 1·40 of a grain of arsenic would most probably be good treatment for it, acting upon the pus and destroying bacteria, and having done its work would become absorbed by the blood vessels with no destructive effect upon the tissues.

It may be used as follows: . Take of the arsenical compound about $\frac{1}{2}$ grain, a portion about equal in size to $\frac{1}{2}$ grain of wheat, place this upon a glass slab and mix with it a drop of water from the end of the finger; then with a nerve broach covered with cotton mix the two thoroughly. This is introduced into the pulp canal, which has been previously cleansed, dried and washed with alcohol. Then introduce the arsenical fluid, being careful to get the canal thoroughly filled. Then dry again, and in the majority of cases fill immediately. Teeth with small and tortuous root canals, into which it is difficult to explore or force a fluid, are probably better left with the dressing in, for a few days.

My statistics, 146 cases in the past eighteen months treated after this manner, show only two cases from which the dressing had to be removed to give relief from pain.

Another advantage in the use of the arsenic in this form is that small particles are carried with the solution into the root canal and remain there. The continual presence of such a germicide in the pulp chamber and canal is perfectly legitimate since the canal is in no way connected with the circulation after the death of the pulp and has no connection with the cementum which will allow the passage of any destructive agent.

These canals, if not filled nor sterilized, would most likely cause

trouble sooner or later. According to Dr. Cunningham they may be safely left without filling if kept thoroughly antiseptic. The plan adopted was to cleanse the pulp chamber and larger root canals, then covering one side of a piece of paper with his arsenical compound he put it into the pulp chamber with the arsenical side toward the canals, then proceeded to fill upon this with cement, finishing with any other material desired.

The plan of using cotton saturated with carbolic acid and other antiseptics and filling over them is one of the oldest of the many methods, but have we not all been obliged to remove many such dressings after they have had time to become useless as antiseptics? The list of agents and plans for dressing root canals is too long to give now. According to our experience nothing so completely fills the requirements in every particular as arsenious acid. Fowler's solution might be used, but its strength is not always certain, and there is no crystal of the salt left in the canal to keep it antiseptic. We have also tried a solution of bichloride of mercury, and even with a 1 to 1000 solution trouble ensued. The powdered bichloride might be used in the same manner as the arsenic, but it is so much more soluble in water, and so dangerous to tissues that it is less desirable.

According to Dr. Miller some very active agent must be used to sterilize a pulp chamber. On page 97 of his late work on "Micro-organism," he says, "Attention has already been called to the fact that the dental pulp presents in a high degree the conditions essential to the formation of spores, and since spores possess high powers of resistance the antiseptic treatment of root canals is thereby rendered more difficulty."

The necessity of destroying these germs is clearly set forth in the same work, page 111, where he says, "I would call especial attention to five different gas-forming bacteria, which invariably form large gas-bubbles in the gelatine, or tear it to pieces, as represented in the figure.

One of these bacteria, which generates considerable quantities of gas in albuminous substances, I found in the human fæces as well as in a gangrenous tooth-pulp. Its appearance in the latter place may help to explain the frequent occurrence of dental abscesses. If a tooth be filled before removing the necrotic pulp and sterilizing the root canals, the gas formed will force itself through the foramen in the apex of the root, or carry particles of the putrid pulp along with it, causing irritation, if not immediate inflammation of the pericementum."

This it would seem, not only from recent investigation, but from the past experience of most practitioners, that the agents used have been such as would destroy organisms and spores, whether they were used with this idea or not. But in many cases the teeth were kept sore for weeks, and sometimes months, by the frequent introduction of steel points or worse remedies, each time introducing a few more bacteria, and explaining to the suffering patient that the case was a most difficult one to cure. On the other hand the rational treatment would seem to be that of removing the exciting cause by thoroughly sterilizing the pulp chamber and canal in the shortest possible time. These exciting causes may be foreign bodies, either fluids, solids or gases, all of which are accompanied with bacteria. Once these influences are removed the spontaneity of tissue is such that it will soon return to its normal condition. If the idea of the natural tendency of tissue to return to its normal condition can be thoroughly instilled into our minds, and also that we are simply to allow the living tissue to do what it is continually trying to do, then the treatment of abnormal conditions is greatly simplified. Time will be saved to patient and operator, and we will soon find ourselves in touch with nature, which means immediate success in many cases where we now have much trouble.

Let us then keep in mind the old axiom, "The cause removed the effect ceases," and our trouble in the treatment of pulpless teeth is reduced to a minimum, and our patients saved both time and annoyance.

IS COCAINE, EMPLOYED AS A LOCAL ANÆSTHETIC, DANGEROUS?

On the 2d of December, 1890, M. Hallopeau reported to the Academie de Medecine a case of chronic cocainism induced by a single injection into the gum of 8 centigrams of hydrochlorate of cocaine. From a study of this case, he believes himself authorized to deduce the following conclusions:

A single injection of cocaine, even in a small dose, may not only produce immediate toxic symptoms of a grave character, but may give rise to symptoms persisting for several months. These distant symptoms are analogous to those perceived sometimes immediately after the injection, viz.: obstinate headache, insomnia, numbness of the extremities, attacks of faintness, dizziness, prostration, loquacity and a state of great agitation. These accidents are chiefly observed in very excitable subjects.

In the current number of *La Medecine Moderne*, M. Reclus, who employs cocaine largely, endeavors to controvert these statements of

M. Hallopeau, and asserts that, properly managed, this valuable anæsthetic is innocuous. The rules to be followed in the management of this drug are, according to M. Reclus, as follows:

1. The quantity of cocaine injected should never exceed 12 centigrams, 2, 4, 6, or exceptionally 8 centigrams sufficing for most minor operations.

2. Employ a *weak solution* (2 per cent.).

3. Avoid the introduction of the drug into the interior of a blood-vessel. The best way to avoid the evil consequences of such a *contretemps* is to push the needle into the tissue slowly, and while so doing to press on the piston-rod at the same rate. In this manner, even if a vessel be pierced, only a small proportion of the fluid can mingle with the blood contained in the wounded vessel.—*Archives.*

THE PRACTICAL PLACE.

Among the many methods adopted for adjusting a porcelain crown with a collar around the root, the one formulated by Dr. E. Parmly Brown seems the most practicable. The doctor describes it in the following words. " A collar is made of platinum to fit the end of the root, and the band is left wide enough so that it may be cut in slits all around down to the face of the previously prepared root; the projections are then bent down, one at a time, over the end of the root, forming a complete covering or cap. A crown is then placed in position, the pin passing through the cap iuto the pulp canal, and cap and tooth crown removed together and fused together with porcelain in the furnace. The cap may also be soldered to the crown."

Acid in Tooth Powders.

At a recent meeting of the New York Odontological Society, Prof. A. H. Elliott, of the College of Pharmacy, related a peculiar experience he had a short time ago.

He said that a woman asked him to give her a certificate of the purity of some wonderful tooth powder she was selling, as she desired to advertise it. The professor told her to leave a bottle with him and he would test its contents.

In testing it he found that it contained 18 per cent. of hydrochloric acid. The professor was amazed, as the woman had represented the powder as perfectly harmless, saying that she used it twice a week herself, and was selling lots of it to bankers and brokers to take home to their wives. The professor refused to give the certificate and reported the matter to the proper authorities.

The Use of Rubber Dam.

"I trust that no one is in the habit of using the same piece of rubber dam on different patients, and hence, I only refer *en passant* to the possibility of inoculation and the transmission of disease from one patient to another. This is notoriously probable when the rubber dam has been used in the mouth affected with pyorrhœa alveolaris. Indeed, it is possible to transfer the disease from one part of the mouth to another in the same person; hence, it should not be used a second time in the same mouth. Of course, I understand that the rubber dam is always washed before a second using, yet we know that disease germs are subtle and some of them even microscopically undistinguishable. Furthermore, it ought not to be used a second time in the same mouth because of the unpleasant sight of using a thing like that which does not look fresh; the dam is at best unsightly, and taking it from a book of blotters, or from an envelope with a patient's name on the same, or from a row hanging on the wall with the patient's name stamped on each piece of rubber, or picking it out of the waste basket, memory and identification of the holes in the rubber acting as a guide for the identification of the rubber—neither of these methods is pleasant and should, therefore, not be resorted to. The cost of the rubber is almost nominal, and the expense should be considered as much a legitimate one as the gold introduced, and also as an essential accompaniment of the filling, the cost each time being from 2½ to 5 cents. Considering an extreme case in which all possible operations may be performed in one I doubt that the expense of rubber dam could be more than $2 00, which would represent only a comparatively small portion of the entire expense." Louis Ottofy, D.D.S., Chicago, Ill.

To Clear Shellac Varnish.

For clearing shellac varnish, the opacity of which is due to wax and other substances which are insoluble in alcohol, E. Krissel recommends the addition of a small quantity of lead carbonate, mixing well, and allowing the varnish to settle for ten or fourteen days.

Snake and Dog Bites.

The Berlin correspondent of the *Therapeutic Gazette* reports that a remedy for blood poisoning caused by the bites of snakes and rabid dogs has been discovered in Africa, by a Dr. Engels, in the "wild growing, black noble palm." "Five hundred negroes bitten by poisonous snakes were treated with the extract of the noble palm,

and 487 were cured in five days. Of 67 farmers and negroes bitten by rabid dogs, 65 were saved, while two died of weakness. The remedy is injected under the skin, and causes a moderate fever, not exceeding 35.5° C. On the third day the patient is without fever, swelling, and inflammation of the affected part have disappeared, and on the fifth, or, latest, on the seventh day, the patient is cured."

WHEN you've got a thing to say,
Say it! don't take half a day.
When your tale's got little in it,
Crowd the whole thing in a minute!
Life is short—a fleeting vapor—
Don't you fill the whole blamed paper
With a tale, which at a pinch,
Could be cornered in an inch!
Boil her down until she simmers;
Polish her until she glimmers.
When you've got a thing to say,
Say it! don't take half a day!

—*Atlanta Constitution.*

ALUMINIUM AMALGAM.

Dr. Carroll has introduced an aluminium amalgam, for which he claims non-shrinkage, density, and superior edge-strength, and that it will not oxidize. At the April meeting of *The First District Dental Society*, State of New York, he showed some specimens which had a beautiful white lustre, though kept in a box containing a silver quarter of a dollar and some erasing rubber. The coin was tarnished, but the aluminium stoppings were not affected by the action from the rubber.—*The Dental Cosmos.*

IODINE AND GLYCERINE.

Tincture of iodine mixed with glycerine, is claimed by Dr. Hammond to prove more effective as a local application than the plain tincture (Dr. Hammond does not give the proportions). This is due to the retardation of the dissipation of the iodine, or, more likely, to the skin remaining soft, and hence in a better condition for absorbing the drug.—*Western Dental Journal.*

HINTS.

A piece of aluminium wire makes a very handy carrier for conveying

iodine, aromatic acid or any corrosive agent, except muriatic acid. It answers the same purpose as gold or platinum, being non-corrosive soft, pliable and clean; can be bent or formed into any shape and only costs a trifle.

Aluminium wire is very useful for many other purposes in the dental office, such as strengthening rubber plates, pinless teeth, making canal points, etc. I have lately had made to order, some aluminium wire gauze for strengthening rubber plates—it works nicely; by covering the model with gauze and packing rubber over it we can make much stronger plates, the rubber is tougher and more evenly vulcanized.

Copal picture varnish, which may be had of a dealer in artists' materials, will do to paint over an exposed pulp. Damar varnish will answer for the same purpose.

Soda Water as a Mouth Wash.

At the May meeting of the *Manchester Odontological Society*, Mr. Collett drew attention to the fact that ordinary aerated soda-water had been found very useful by him in cases where the saliva was "ropy" owing to excessive mucous secretion. He suggested that patients should keep a syphon handy, and occasionally wash the mouth out with a wine glassful, as a possible deterring agent against caries. Medical men had told him that soda-water dissolved the mucus in bad throat cases as well as anything, and he thought that dentists might possibly derive some benefits from its use.—*The British Journal of Dental Science.*

Cuttle-Fish Bone for Dies.

I read some time since—but where I cannot now recall—an article which said that jewellers sometimes employ the cuttle-fish bone, in common use for birds, as a matrix for reproducing small articles of jewelery, &c., the article being firmly pressed into the cuttle-fish bone, leaving a beautiful impression of the object, into which the metal was poured. I immediately though it would be useful for small dies in crown and bridge work, and having tried it, must say it makes the most beautiful and perfect impression of anything I have ever used, and I wish to call the attention of the profession to it. Shave the bone till a flat surface is obtained, into which press the crown firmly. Remove the crown and over the impression place a small piece of brass tubing, the diameter and height you wish your

die. Pour in some melted Babbitt's Metal, and when cold you will have a perfect die, the making of which has not taken over five minutes. *Frederick H. Lee, in Items of Interest.*

Hemorrhage after Tooth Extraction.

At the June meeting of *The Odontological Society of Great Britain*, Mr. Ashley Barrett showed a small clamp constructed for him as a means of obtaining pressure to bear upon an alveolar socket after the removal of a tooth where troublesome hemorrhage followed. He detailed a case in which it had proved useful, checking bleeding which had persisted for four days. Mr. R. H. Woodhouse referred to Mr. Barrett's clamp, and said a far simpler contrivance was one he had several times successfully used. It was to place a pledget soaked in styptic colloid over the alveolus, and a piece of cork over this. He then ligatured across from the adjoining teeth, and so good firm pressure was brought to bear upon the bleeding surface. This plan was far less irksome to the patient and permitted sleep, which could hardly be the case where a clamp was employed.—*The Journal of the British Dental Association.*

Preparation of Root Canals.

I use a drill always in filling roots. The more I hear about fine broaches that cut to the end without enlarging the canals, the more I wonder how the dentists fill the roots afterwards. I dont believe that fluid gutta-percha will enter those fine canals. I drill such canals as far as it is safe to drill. I don't say that I drill around the curves exactly, although there are curves that you can drill around. In using a drill a very important point is not to push it too far ahead. I use the small drill first for only a short distance; then I withdraw it and clean out all the *debris*; then I use my drill again and clean the *debris* out again with a barbed broach, and so go on until I get to a point where I can feel that I can go no further without passing through the canal wall. Now the question arises where we have a curve beyond where we drill. Take an untempered broach, and if you pass it down and it goes around a curve it will show that curve when you draw it out.—*Dr. Ottolengui, quoted in The Ohio Journal of Dental Science.*

Water-Drinking.—" I am decidedly opposed to the indiscriminate drinking of large quantities of cold water," writes Dr. E. Johnson. "One cannot understand in what manner these large imbibitions are to operate so as to be useful in the animal economy. We know pre-

cisely what becomes of the water soon after entering the stomach; we can trace exactly what course all this water must take—what channels it must traverse—between its entrance and its exit. We are perfectly well acquainted with certain physiological effects produced by it after it has been received into the system. It dilutes the blood, it lowers the temperature, and therefore diminishes the vital power of the stomach; it puts certain systems of capillary blood vessels on the stretch, to the great danger of bursting, and it overtaxes the kidneys. I have seen two very bad cases which were fairly attributable to the excessive drinking of water. Thus, then, it seems there are certain well-understood and very obvious injuries which the large imbibition of water cannot fail to inflict, while the supposed benefits to accrue from it are altogether mystical, problematical, unintelligible. The quantity of water which each person should drink during the day must always depend on his own feelings. He may always drink when the doing so is agreeable to his sensations; when it is repulsive, never."

False Teeth Lengthen Life.

Very few people realize how much the dentist has done for mankind. To mention one thing only, the perfection to which the manufacture of false teeth has been carried has practically abolished old age—that is, old age in the sense that I used to know it, says a dentist. You see none of the helpless, mumbling old men and women that you formerly did. This is not because people do not attain the age their parents and grandparents reached, but because the dentist has prevented some of the most unpleasant consequences of advancing years. Men of seventy no longer either look or feel old, because they are not deprived of nourishing food at the time when they need it most. Estimates have been made showing that the average length of life has been increased from four to six years by the general use of false teeth.—*St. Louis Globe-Democrat.*

A New Local Anæsthetic.

Dr. C. Redard, Clinical Professor at the Geneva School of Dentistry, speaks highly of chloride of ethyl as a local anæsthetic. It is a colorless, mobile liquid, having a peculiar and pleasant odor and a sweetish burning taste. Its sp. gr. is 0.9214. It is slightly soluble in water, but dissolves readily in alcohol. It is sent out for medicinal use in hermetically sealed glass tubes containing a little more than two drachms each. When required for use the point of the tube is snipped

off, and the warmth of the operator's hand is sufficient to cause a very fine jet of the chloride to be projected on the part to be anæsthetized. Up to the present its use has been confined to dentistry and as an external application in neuralgic affections, but there is little doubt that in a short time its value will be tested in general surgery. Its action is similar to that of methyl chloride.

We are indebted to Mr. Minett, of London, for the following details about the composition of fusible metal.

		Fusible Metal expands on cooling.		Fusing point.
	1	Bismuth	8	Below 100°F
		Lead	5	
		Tin	3	
	2	Lead		197°F
		Tin		
		Bismuth		
Rose's	3	Bismuth	2	201°F
		Lead	1	
		Tin	1	
	4	Tin	1	254°F
		Lead	1	
		Bismuth	1	
	5	Tin	1	286°F
		Bismuth	2	
	6	Tin	3	333°F
		Lead	2	
Plumber's Solder	7	Tin	2	Below 350°F
		Lead	1	
Soft Solder	8	Lead	2	Above 350°F
		Tin	1	
Solder for Pewter	9	Tin	2	?
		Lead	1	
		Bismuth	1	

—*Journal of the British Dental Association.*

A GOOD receipe for making waterproof cement, to be used in constructing aquarium, is to take 25 parts gutta percha in shreds and melt it carefully. Add 75 parts ground pumice stone, and then mix in 150 parts Burgundy pitch and melt well together.

TO MAKE tin foil labels adhere to tin collapsible tubes, use a mixture of the best fish glue and gum arabic dissolved in water. A little glycerin may be added to advantage.

THE

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THIRTEENTH PAPER.

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 70, Vol. VI, No. 3.)

MAKING AND TEMPERING INSTRUMENTS.

Despite the fact that instruments are manufactured for the use of the dentist in almost every conceivable form, cases will occur sometimes when an instrument is needed out of the ordinary, to suit the special case in hand; or it may be that the dentist, not living in a city where there is a dental depot, is not enabled to replenish his stock on the instant. Under such circumstances it is well for the dentist to be able to meet the emergency and manufacture for himself what he needs.

STEEL.

Steel is nothing more than iron chemically combined with carbon, whereby it is rendered extremely tough and hard. This hardness is attained by the quantity of carbon combined with it. Steel should contain from 0.833 to 1.67 per cent of carbon. If a greater amount than 1.67 per cent. be combined, cast iron is produced and not steel.

TO SOFTEN STEEL.

Steel may be made quite soft, and when of a certain size it may be twisted and bent back and forth without breaking, and may be easily tied into a knot like soft annealed iron wire. This condition may be attained by placing steel rods or wire into an iron cylinder, sealing this up securely with fire clay at both ends and subjecting it to a bright red heat for a long time and then letting it cool down, surrounded by coal, very slowly.

For all the ordinary purposes of the dentist, however, a sufficient softness may be attained to enable the steel to be filed, or turned in a lathe, by heating it to a bright red heat and then laying this on a

piece of board, another piece of board is then laid on this and the two pieces screwed tightly into a bench vise and permitted to cool

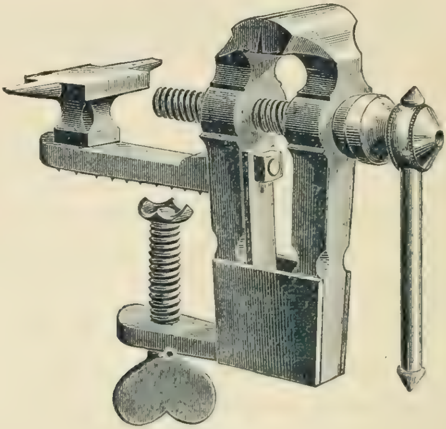

FIG. 194

slowly. Subjected to this process two or three times, the steel becomes quite tractable and is readily filed or bent.

MAKING INSTRUMENTS.

To form an instrument, the steel (we will say an old excavator) is held at one end with a pair of hand vises, as shown by Fig. 195.

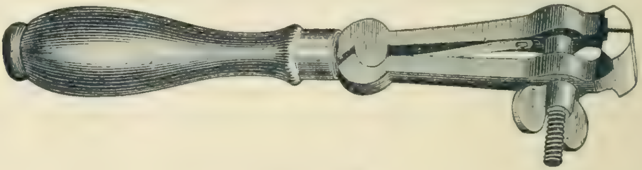

FIG. 195

The end that is to be worked or formed into shape, is heated red hot when it is reduced in size (should it be too large for the purpose it is wanted) by hammering it on the small bench anvil Fig. 196. This hammering should not be continued too long, as such a process will render the steel brittle, but the reduction in size should be gradual, and made by frequent heating and frequent hammering. It is better to have the steel a trifle large and reduce it to the size wanted, than to select an old instrument just of the size necessary, as the proper hammering of the steel improves its cutting qualities.

When reduced to the proper size, it is again heated and permitted to cool slowly. It is then partially filed into shape *while straight.*

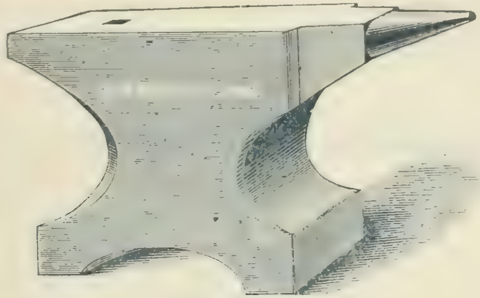

FIG. 196

Let us say that we desire to make excavators like Fig. 197. The steel is first filed into shape like Fig. 198. This may be done more easily before bending, after which it may be bent as desired, like those shown in Fig. 197. In bending the steel care has to be used. It should be heated and bent into the desired shape little by little.

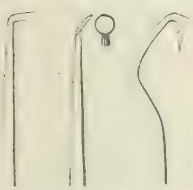

FIG. 197

FIG. 198

After it is bent into the shape that is wanted, it is filed to the size, and then sand-papered perfectly smooth.

TEMPERING.

To temper steel, it is first made as hard as possible. This is accomplished by heating the instrument to a bright red color and then suddenly plunging it into a bowl or other receptacle of cold water. As a test of its hardness, the steel assumes a greyish white appearance, and in this condition it will readily scratch glass, or a file is incapable of cutting it.

The instrument thus tempered would be too hard to work with, for if brought to a keen edge in this condition the edge would be continually snapping off, and require continued sharpening. It is therefore necessary to *draw the temper*. For such instruments as are used by the dentist, this may be accomplished as follows:

The hardened instrument is first brightened or polished at the point where it is necessary to *watch the temper*. This is done by means of sand paper or with a brush wheel charged with pumice stone. in the

polishing lathe or in any way most convenient; so that the part is bright. The instrument is then held in the blaze of the spirit lamp about an inch or more from the cutting edge as shown by Fig. 199. By watching the brightened surface of the instrument it will be seen to change color as the heat affects the metal. The first color will be

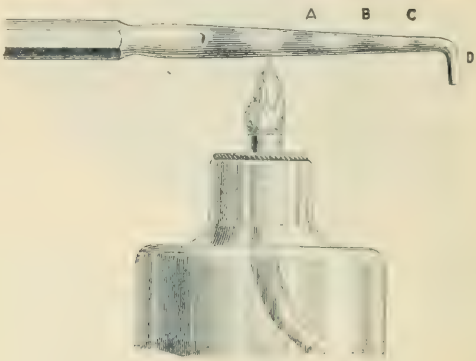

FIG. 199

a light straw, then a *dark straw*, then a *light blue*, and finally a *dark blue*. These colors will follow each other in the order named. Thus when the first color appears it will run along the instrument towards the point of its least magnitude, to be succeeded by the next color and then the next, and so on. As soon as the blade of the instrument indicates a *light straw*, it should be plunged into water, this color being the best for cutting tools, like excavators. Some persons find this color a little hard, which if such is the case the instrument is apt to snap, being brittle, so that they prefer to let the color run to the *dark straw*. Dark straw, as a general rule, is more adapted to pen knives, lancets and the like, which are not subjected to the cutting of such hard tissue as Enamel or Dentine. A B C and D on Fig. 199 indicate the different colors that are seen on the shank of the instrument when heat is applied to it. *A being dark blue*, *B light blue*, *C dark straw*, and *D light straw*. Enamel chisels should be tempered to a light straw. It is said that steel may be rendered intensely hard by heating red hot and plunging into a vessel of mercury. By this process the silvery grey or white, indicating the most intense hardness of steel, is always produced.

Probes and nerve extractors are readily made from piano wire, without removing the temper from the piano wire. A piece of wire of the necessary size and length is mounted with a handle of any hard wood, and made secure therein with gum shellac. About one and a

half inches from the end it should be *ground* to a gradual taper, by holding it in the hand and turning it round and round while holding it against a revolving corundum while in the polishing lathe, the wheel being kept wet while so doing. A more gradual and more regular attenuation can be obtained by laying the probe on a bench or table, and giving it a wiping motion from the place where the gradual taper begins, to the point, turning the instrument round and round while so doing; but Dr. Bonwill suggests a still better way, and that is to cut a disk of semi-vulcanized rubber—packing rubber—out of a sheet of this with a gun wad punch, make a hole in the center and place it in a Huey mandril, like Fig. 200. Now place a sand-paper disk with the grit towards the rubber disk; place this in the dental engine and turn it, holding the probe between the rubber and sand-paper disk, and turning the probe while so doing. Fig. 201 shows Dr. Bonwill's arrangement for this purpose.

Fig. 200

For making a hooked probe with which to remove a devitalized pulp, the procedure will be the same as that above described. When the probe is reduced to a very fine point, the point is passed quickly to and fro through the blaze of the spirit lamp, so as to soften the point in order to bend it to make the hook. The late Prof. Buckingham suggested the following manner of forming these hooks:

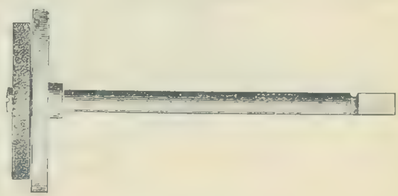

Fig. 201

One nose of a pair of small, *flat nose* pliers is brought to a very fine point like that shown in Fig. 202, either by grinding one nose or

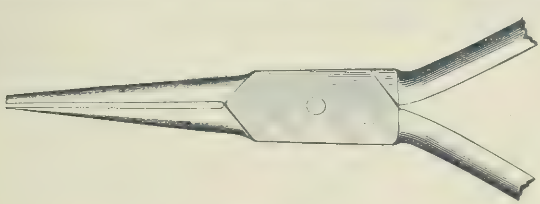

Fig. 202

by removing the temper and filing, and re-tempering it. When the nose of the pliers is thus formed, the probe is placed between the noses, permitting only so much of the probe to extend beyond as is sufficient to form the hook as shown by Fig. 203. The probe is then

hammered over on the attenuated nose of the pliers so as to form the hook. as shown by the supplementary cut in the same figure.

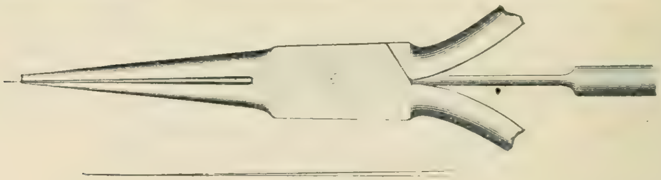

FIG. 203

THE BRACKET AND BRACKET TABLE.

The Bracket is an arrangement of cast iron which is fastened to the window frame, and pivoted so as to swing in order to bring the Bracket Table, wherein the instruments are kept, within easy reach of the operator. There are a number of these on the market. Fig. 204 shows its general form or arrangement. It should be strong and

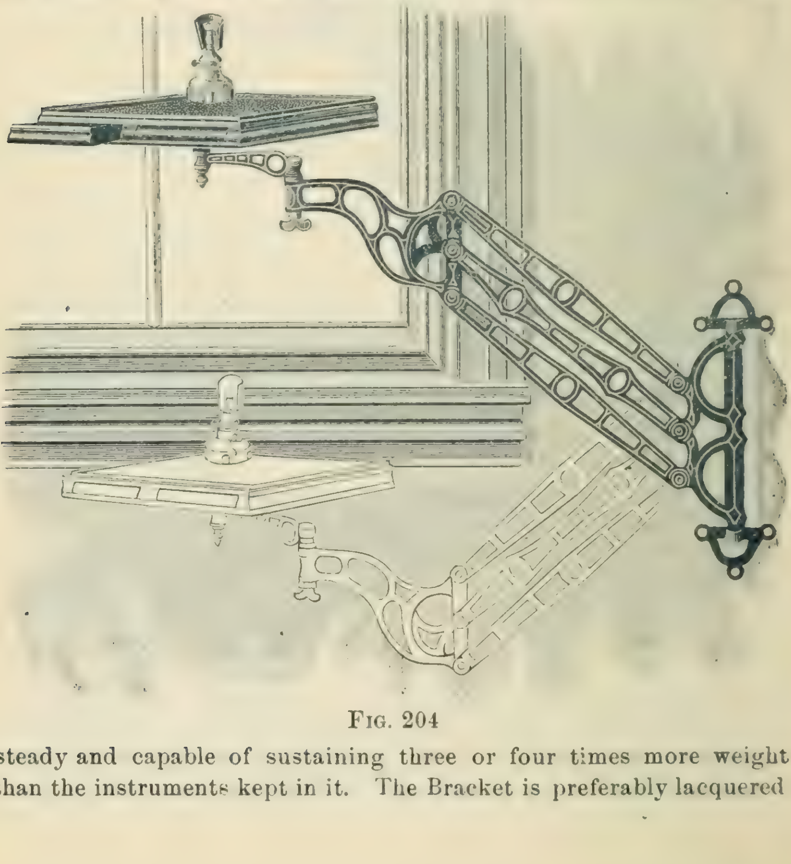

FIG. 204

steady and capable of sustaining three or four times more weight than the instruments kept in it. The Bracket is preferably lacquered

than nickeled. For although the latter looks prettier, the brightness of the nickeled ones soon wears off, and looks tarnished unless the utmost care is given to keeping it bright and polished.

The Bracket table is an arrangement of wood shown in Fig. 205. It consists of six drawers, and two receptacles wherein brass drills and disks for the dental engine are kept. The drawers should be made so as to pull or push out from either end, and they should be of

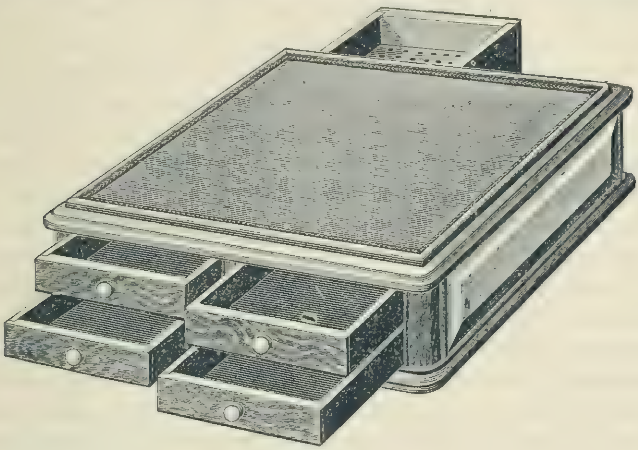

FIG. 205

different depths. The two upper drawers need not be more than $\frac{5}{8}$ of an inch deep, the two middle drawers 1 inch deep, and the lower drawers $1\frac{1}{4}$ inches deep. The table may be 15 inches square, and the receptacles on either side of the table $3\frac{1}{2}$ inches wide, 15 inches long, and as deep as the depth of the table. It has been suggested that the top of the table may be covered with a piece of white paper on which a pane of glass is put, this being kept in place by a beading of wood running around the top edge of the table. This is done with the view of keeping the table tidy, for the spilling of alcohol from the spirit lamp, or ammonia, carbolic acid or other drugs from the bottles in which they are kept, on the top of the polished wood, of which the table is made would soon take off the varnish and destroy the appearance. On the other hand the constant dropping or removal of the steel instruments on this glass top, would soon scratch it, and make it almost as untidy as the defaced wood top. The only thing is, that a new pane of glass could be more easily, quickly and cheaply substituted, when one gets scratched, than to have the wood top re-varnished and re-polished.

The drawers of the bracket table should be partitioned off to contain instruments of different classes. Thus the *upper left hand drawer* may be divided for excavators and nerve instruments, and these sub-divided, so that each class of instruments will have its distinct compartments. The *upper right hand drawer* may contain pluggers, lancets, root trimmers, &c., each having their separate compartments. The *middle left hand drawer* may contain compartments for separating files, gutta percha filling, brushes for cleaning the teeth, a box with pumice for cleaning the teeth, gold for filling the teeth, &c., &c., &c. The *middle right hand drawer* may contain compartments for enamel chisels, scales, burnishers, amalgam pluggers, &c , &c. The *lower left hand drawer* may contain compartments for small pieces of absorbent paper or spunk, dental matrices, the dental syringe, the tweezers or file carriers, the dental mirror, &c., &c., &c.; and finally the *right hand lower drawer* may contain the clamp forceps, the curved blade scissors, the rubber dam punch, the clamps, the file carrier, &c., &c., &c. Of course, the arrangement of the different drawers, as indicated, is arbitrary, and each operator may arrange the drawers according to his own ideas, and accordingly as he finds most convenient to his manner of working. We have only suggested these arrangements so as to indicate a system of order, whereby each tool is known to have its place where it *always can be found.*

In the arrangement for the receptacles on either side of the bracket table, with the burs, drills and disks for the dental engine, the same system should be observed for the different class of tools. Thus a certain number of holes should be set aside for *round cavity burs*, a certain number for *wheel cavity burs;* a certain number for *fissure burs,* a few holes for *drills*, and a few for *plug finishing burs;* and each class should always be kept in their own group. In the other receptacle the corundum disks, corundum wheels and points, the sand paper disks, the polishing rubber points and wheels may be kept, also in their several groupings. By observing this system and order a picture of the arrangement of the whole interior of the bracket table is soon impressed on the mind, so that the fingers go, without an effort, just to the tool that is wanted, and finds it in its place.

MANNER OF WORKING.

It is well, while working, not to permit the top of the bracket table to get too crowded with instruments. If this is permitted much valuable time is lost in searching for the tool that is wanted. True, cannot always be avoided, but by being systematic, and by re-

placing each tool where it belongs (when this can be done) after using it, better progress can be made. When treating cases of putrescent pulp, of course the instruments cannot be replaced in their compartments, as they need to be cleansed and sterilized after each use: but in such cases it is well to have a narrow, deep cup nearly filled with water, under which a lamp is lighted so as to keep the water boiling. Into this the nerve instruments and probes, the excavators and reamers should be plunged so as to avoid any contamination from septic poison.

After a cavity of decay has been prepared, and the case is ready for filling, all the excavators, burs, drills, &c., should be removed from the table, placed in a tray, and given the office boy to clean. If the cavity is to be filled with gold all the tools that are needed for such a case, all the appliances and everything that is to be used, is to be placed where they are ready at hand. In this way the patient is not subjected to any more delay than is absolutely necessary for the performance of the operation, nor the operator trammelled by a needless search for the tool wanted. In like manner if the cavity is to be filled with amalgam or gutta percha, all such tools as are needed for these materials, and for the case in hand should be laid within ready and easy reach. So, also, this observance is to be used in any operation that is to be performed. It would be very senseless to mix phosphate cement on the glass slab ready for inserting in a cavity and not have the instruments at hand necessary to introduce it into the cavity. By such a procedure, the material may set, or get too stiff to be worked properly before the tools for packing it into the cavity are obtained. It is therefore necessary to have all tools at hand, and to avoid all hurry or confusion.

In the preparation of a cavity of decay *never be in a hurry to fill.* Be sure that it is well shaped, that the margins are made smooth and well defined, and the approach easy. Much time and vexation will be saved if this be observed. It is also well to begin the preparation of a cavity with *small instruments*, and increase the size of these as progress is made, and as the extent of the cavity and the direction of the decay are discovered. Should the preparation of the cavity consume so much time that the filling of it could not be accomplished without hurry or excitement on the part of the operator, or without encroaching on the time of the next patient, it would be better for the operator to fill the cavity temporarily, though he may loose a quarter or a half hour by so doing, rather than fill the cavity hurriedly or encroach on his next patients time.

In using burs or drills for the dental engine, it will be found much better as each of these is removed from the hand piece to put it back in its proper hole, in the receptacle of the bracket table, after which they may be cleaned by the office boy. By getting into the habit of working in this way, much valuable time is saved; it gives no more trouble and it permits less confusion than to remove it from the hand piece and throw it on the top of the bracket table. By so doing, many of these burs lie scattered over the top of the table and time is lost in searching for the one that is needed.

[TO BE CONTINUED.]

A WAY OUT OF THE DIFFICULTY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

It is the experience of all dentists who have cases of decay extending above the gum margin, that in the effort to apply the dam they cannot get this to embrace the tooth above the border line of the decay, because the gum is tough and unyielding at other points and therefore

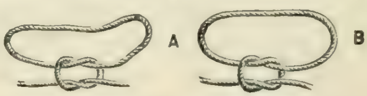

Fig. 1

when the ligature is applied, this lies across the cavity instead of lying above the margin of the decayed cavity. A ligature may be applied as indicated by A, Fig. 1, but when pressure is brought on the ligature so as to bind it to the tooth, it assumes the shape of B; that is it will only tie in a straight line. Fig. 2 represents such a case. Decay has extended to such a point as to be above the gum margin at one of its proximate surfaces, while at the other the tooth

Fig. 2

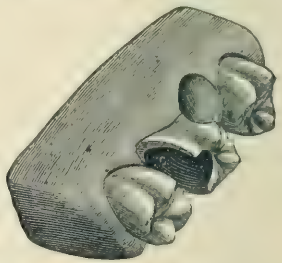

Fig. 3

is intact. Now we have produced an absorption of the gum at the point where the tooth is decayed, by packing gutta percha between the teeth. We can see and work easily at this point, and can prepare

the cavity thoroughly. Our next effort will be to produce a similar absorption of the gum at the point where the tooth is *not* decayed, as shown by Fig. 3. This is done by packing gutta percha between the teeth, as shown by the cut, both on the buccal and palatal sur-surfaces. In this way the gum is forced back well from the neck of the tooth, and lies so loose and flabby that the dam may be applied and the tooth so well, easily, and painlessly ligated, that the dam is readily faced up over the margin of the decayed cavity so as to afford the utmost comfort and security against blood and moisture that could be desired by the operator.

It will sometimes be found, however, that this packing of gutta percha at both proximate surfaces of the tooth that is to be filled, is not sufficient, as the gum lying close on the buccal and palatal surfaces of the tooth is so tough that it prevents the dam being faced up on the neck of the tooth at these points. To get over this difficulty, it will be necessary after packing gutta percha at both proximate surfaces, and producing thereby an absorption of the gums at these points, to ligate by wrapping rather coarse gilling twine two or three times around the tooth, forcing the ligature well up under the gum *all around*, and reapplying the gutta percha at the proximate surfaces.

When the case next presents, the dam may be applied so successfully to the neck of the tooth, on account of the flabby and loose condition of the gum all around the neck of the tooth, that nothing more can be desired for its thorough application, and the operation may proceed with the utmost comfort to the operator, and very little discomfort to the patient.

A NEW WAY OF MAKING DIES.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

The above caption has been placed to our credit without any effort made by us for originality, or of any desire on our part to make such a claim, and, indeed, with the knowledge that such a claim was not original with us. We propose to set ourselves right.

Many years ago—in 1847—when we began the study of dentistry with our preceptor, Dr. Wm. S. Monefeldt, in Charleston, South Carolina, one of the ways that dies were made was to dry the plaster model thoroughly. Lead, (sometimes zinc) was melted and poured into an iron box, made in the shape of a casting ring or a ladle, like Fig. 1. When the lead or zinc was nearly ready to chill the plaster model was plunged into it, (deep enough for the proposed plate) and there held until the metal solidified. This was then thor-

oughly cooled and the plaster model removed from the metal. This left the impression of the model in the metal. The whole of this

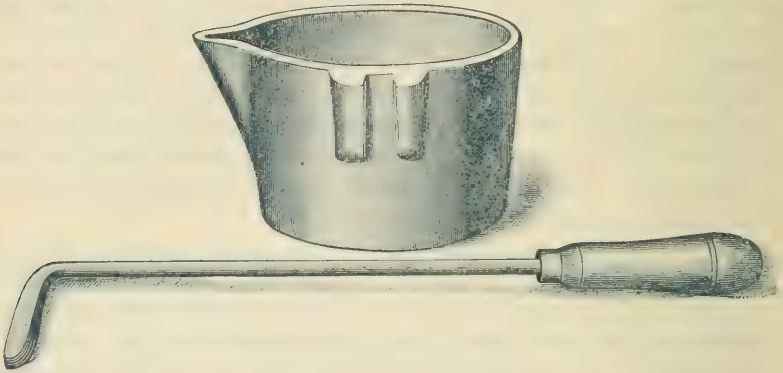

FIG. 1

surface was then painted with thin whiting and water and allowed to dry. A casting ring like Fig. 2 was then placed over this metal impression, and zinc was melted. The zinc was permitted to get nearly cold, so that it would just barely flow from the ladle, and when in this condition it was poured into the casting ring. When chilled the two were separated (if they did not unite, which was frequent) and thus the die and counter die was obtained.

The process was open to many objections: Firstly, the model was utterly destroyed. Secondly, the two metals frequently united. Thirdly, when the arch was at all high, as shown in Fig. 3 there would be a sinking or settling of the metal counter, as shown by the dotted lines, which of course made the die inaccurate.

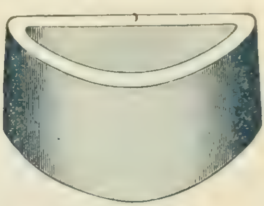

FIG. 2

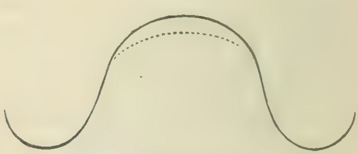

FIG. 3

It will therefore readily be seen that we could not conscientiously claim as our idea a process which we were taught as far back as 1847.

Now for the explanation of how this caption was credited to us.

A fellow practitioner approached us to ask how he could make a Babbitt metal die with a lead counter. We asked him why he wanted

a lead counter with such a die? He said he believed that a metal plate could be more intimately and accurately swedged against a die *not having* the form of the suction chamber cast on the die, than it could be done when a die was made *with* such a chamber cast on it. "It can be done with a zinc die, but I wish to know if *you* know a way to do it with Babbitt metal?"

He said further, that he was in the habit of making the die plain, and after he had swedged his plate he would cut out a piece of thick brass plate the shape of the suction chamber, Fig. 4. This he would

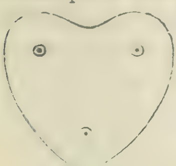

Fig. 4

solder to his swedged plate, in its proper position with a minute piece of solder. The plate was then re-swedged, and the piece of brass would sink into the soft lead counter, and be the means of his making the cap or cover to the plate.. "If this be done with the counter metal used with Babbitt metal" said he, "the counter is too hard to let the brass sink into it, and the plate is apt to be twisted or stretched by too much pressure brought in the roof of the mouth. Therefore, I would like to know how a lead counter die may be made to a Babbitt metal die?"

About this time a new style flask, for making dies and counter dies, was put on the market. One of these was sent me by the manufacturers, and in my letter of thanks, I wrote them what I told my dental friend, which was to make a very thin plaster model and dry this

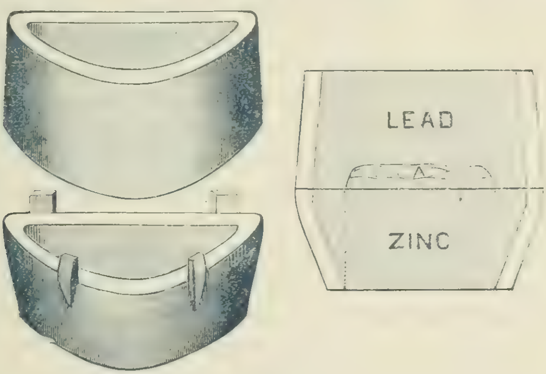

Fig. 5

thoroughly, to place this over the funnel shaped opening of the flask (after this had been filled with moulding sand). Lead was then melted and poured into the casting ring, and when this had cooled the Babbitt metal was melted and poured into the lead impression,

through the funnel shaped opening of the flask. The same may be accomplished with a Bailey's flask, which we illustrate in Fig. 5.

The process merely consisted of reversing the order of things, viz: of making the counter die first and the die last. It differed from the dipping process which we were taught only in so far that the metal *was poured on the model*, not *the model dipped into the metal*. It was not open to the objection of that process—namely, the sinking or settling of the metal at the roof or crown part of the arch as shown by the dotted lines of Fig. 3, because the metal was poured on the model and could not settle as in the dipping process. Nor were the two metals liable to adhere, because the Babbitt metal melted at a lower temperature than lead, and thus did not affect the lead. We do not consider it the best way to make a die, but only suggested it as a means of overcoming what appeared to be an impossibility.

WELDING BANDS FOR CROWN OR BRIDGE WORK.

Dr. Melotte says: "Pure gold, or gold of any carat ordinarily used in crown or bridge work, in making bands or collars, can be united or welded without the use of solder."

A creamy paste of borax and water is made by rubbing the borax in water on a slate or ground glass, and is applied to the surfaces of the metal; then with a soft flaring flame of the blow pipe the entire band is brought to a perfect red heat, when a concentration of the flame will produce a slight surface fusion or welding. It will be understood that in this welding the edges are lapped. The advantage of thus uniting metals without solder is, that the carat of gold is not lowered at the point of contact, rendering the entire band more malleable and therefore more readily adjusted to the natural crown, and less liable to melt in future heating. Should a stretching of the band be found necessary, it can be done on the horn of an anvil at the point where the lap is made." . . . .

"The molecules of the upper layer to the lower layer will come in contact with heat and readily unite. If you are not careful you will spoil your band, so it is well enough to take a good many pieces of gold and lap them. In doing this work it is well to have a blacksmith's heat, which is a general heat, heating your band up thoroughly before you concentrate the heat, otherwise it is better perhaps to point the flame a bit—heating it up until the material is ready to melt, then you get your welding. You may spoil a number of bands of gold before you are able to succeed, but you will be surprised how well you can do it if you learn to emit a nice flame with the blowpipe."—*Dental Register*.

We can readily conceive how the above is a nice operation requir-

ing considerable practice and dexterity, as we also can admit how much superior a band thus made would be infinitely preferable to a soldered band. We would suggest that bands thus made should be so lapped as to be *too small* so that by stretching on the horn of the anvil *a uniform thickness* throughout the band could be thus attained which would permit of its being more accurately fitted.—Ed]

REPORT OF THE PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

Dr. W. H. Trueman read a paper entitled "Suggestions regarding Dies and Counter dies and Swaging Dental Plates."

SUGGESTIONS REGARDING DIES, COUNTER-DIES, AND SWAGING DENTAL PLATES, BY WILLIAM H. TRUEMAN, PHILADELPHIA.

An accurate metallic die may be truly said to be father to a well fitting dental plate; it does not, however, insure one. However essential may be accuracy of the face of the die not less so is the mass and form of the body of the die and the counter die. Both must be shaped and proportioned the one to the other in strict relation to the duty required or they will fail to accomplish the desired purpose. The counter-die is the anvil which resists and converts to use the hammer blow force transmitted through the die. It therefore should have mass sufficient to offer effective resistance, and sufficient softness or elasticity to force the plate into close contact with the die. If defective in mass the blow is transmitted to the anvil upon which it rests, and so far as any useful purpose is served, is lost. If hard and unyielding, the plate, while made to conform to the general shape of the die, is forged or compressed at the points of direct contact, and thus being made of unequal density is liable to warp or change its shape when exposed to heat. Swaging, when properly performed, is not simply a bending to shape, it is really a moving, a flowing, a changing in position, a readjustment of the molecules of the metal of which the plate is made. A successfully swaged plate is a plate at rest, there is no part under strain, there is no tendency in any part to assume its former shape, it should, therefore, and will, bear annealing without perceptible change of form.

To accomplish this, from the beginning of the operation to its end the force applied in swaging should steadily tend in one direction only, particularly so at its later stages. A die so shaped that the hammer blows tilt it to one side, or from one side to the other, or so fitted to the counter-die that the force of the hammer tends to give it a sliding motion in any direction, or a counter-die which does not

equally well support every portion of the plate, however accurate they may be in other respects, can never produce a well swaged plate. They may make one to fit the cast, but unless under the most fortuitous circumstances its accuracy of fit will be lost during soldering.

Without going into these details of construction with which we all are familiar, we may briefly say, that the ideal metallic die for swaging a dental plate will, so far as its face is concerned, be an exact counterpart of the plaster cast. Its base and face will, as nearly as may, be parallel. It will have sufficient mass to bear without injury the force required to drive or press it into the counter-die. It will be so shaped that the force applied tends in one direction only. It will not be so massive as to absorb to any appreciable extent the force resulting from the hammer impact. The general shape will approach that of a cone, the small end being the base.

There is on the market a moulding flask intended to give to the die and counter die a *supposed* suitable shape. In its use there is intentionally produced beyond the border of the face of the die a wide ledge, giving it a broad bearing upon the counter-die all around and beyond its face. This is decidedly objectionable; it makes the base of the die so large that it is difficult to direct successive hammer blows centrally. Also, the broad bearing prevents the die being driven into the substance of the counter-die sufficiently well to force the plate into the depressions of the die. The shape is also unwieldy, and inconvenient to handle.

Swaging a plate may be divided into two stages, each requiring, if an accurately fitting plate is desired, a separate die and counter-die. Presuming that we are in possession of two such dies and their corresponding counter-dies, select and reserve that which seems most accurate for the final stage of the operation. By means of suitable tools the metal of the intended plate is now, as nearly as may be, wrought to approximately fit the die intended to be first used, it is now annealed and placed into position between the die and its corresponding counter-die. Force is now applied tending to press them together, it may be by a screw press, between the jaws of the bench vise, or a few light blows of the hammer, the die and counter-die resting upon the anvil. It is desired at this stage to simply settle the plate into the place it shall, during the subsequent stages of swaging always occupy, and as from various causes it may, and frequently does move from the position in which it is first placed, this swaging is carried only sufficiently far as to assure that unless purposely changed the plate shall not be again displaced. Until the plate has assumed the

more marked irregularities of the die, so far as it is a simply a *bending* of the plate and there has been no intermolecular movement, the position of the plate, if as frequently annealed, may be repeatedly changed with no greater injury than a roughening of its surface. If this preliminary swaging is carried too far, a change in position cannot so readily be made and always results in more or less permanent injury to the plate. The position of the plate being satisfactory, the plate, after reannealing, may now by swaged until it closely conforms to the die. It may now be made, by the use of suitable tools, to assume nearly the required dimensions, nearly, but not quite. Until it has been once swaged upon the last or finishing die the plate should not, in laboratory parlance, "be fitted to the lines;" until then there is apt to be a drawing in at some points and an extension at others making this caution necessary if accuracy of outline is desired. It is desirable, however, indeed it is necessary to remcve as nearly as may be all the surplus metal that extends beyond the intended outline, so that it shall not interfere with the accurate adaptation of the outer border of the plate. The reannealed and approximately fitted plate is now placed between the finishing dies and the dies driven together by a light blow. Now examine and make sure that the plate during this preliminary swaging has not changed its position, an accident liable to occur if the plate is small, especially liable if that portion of the mouth upon which it is intended to rest is flat, or if the arch is very high and the plate fitting the anterior portion or the lateral portion of one side only, and very liable to occur in swaging a full lower plate for a very flat ridge. In this final swaging especial care is needed in holding the die and in handling the hammer. The die should be firmly grasped by the left hand and steadily held with as much downward pressure as can be well exerted. The hammer handle is grasped by the right hand about its middle or if the hammer is heavy rather nearer the head. In striking the blow the hammer should descend as nearly perpendicular as possible, striking the die squarely and solidly. As the blow is struck the hammer should be held down firmly and not allowed to recoil. The blow should be made to as closely as possible resemble that given by the old-fashioned drop hammer, a machine closely resembling a miniature pile driver, that in the times gone by was, in every well appointed dental workroom, as commonly seen as the rolling mill. The ringing, resounding blows that makes such merry music in the blacksmiths shop, be the dies ever so accurate or well shaped will never from them produce a well fitting dental plate. There is an interval of time required for the molecules

of the metal to adapt themselves into the position into which they have been driven, during which the force of the hammer blows should be as nearly as possible maintained. This is the reason that the screw press, the drop hammer, and the punching blow of the steam hammer is so effective in shaping and forming metals in mass and in sheet. A man of muscle in the dental laboratory of old was a perfect terror to the boy who made the dies. His heavy, quick, vigorous blows, not only did not swage the plate but often so forged it that an accurate adaptation to the cast of that piece of metal was an absolute impossibility, and the boy of course was given fits.

Between forging and swaging, is the difference between a plate that fits and will, during and after the subsequent manipulations, if they are performed with reasonable care, continue to fit. Forging is to change in shape by the hammer, to change the shape, thickness and density of the metal; swaging to sink down by its own weight, in other words, as applied to this operation, to take on another form without material change in thickness or in density in those portions of the plate which are pressed into depressions and those which are stretched over elevations; it is indeed, as applied to the construction of a dental plate, a process of metal spinning; a change in form of the metal, so wrought that the metal remains during and after the process as passive in all its portions as though it had been fused and cast.

A long laboratory experience before the advent of vulcanite, when plates of gold and silver were alone used, impressed me that the trouble with ill-fitting and warped plates was largely due to the manner in which they were wrought to shape between the dies. An accurately fitting metal plate unless it be made of thin soft platinum such as is used for the base of continuous gum, cannot be made with one die and counter-die. The last swaging upon the first used die should be a thorough one. In many cases it is necessary and advisable to direct the hammer blows around the edge of the die so as to thoroughly shape any particular portion of the plate that, owing to greater irregularity of surface at that point, may require it; it is permissible also, and advisable, at times, to reverse the position of the die and counter-die and apply the hammer blows to the counter-die, even to turning it over upon its side in order to secure a closer adaptation of an overhanging alveolar ridge. It is best, however, in all cases, to use the hammer no more than is necessary to thoroughly accomplish the desired purpose, and to so apply this force as to gain the desired end as quickly as possible. In using the finishing die, if

the previous swaging has been properly done, a single swaging, a few solidly applied blows will, in a large majority of cases, be all that is required; more than this in most cases defeats the purpose.

It is not always, indeed it is seldom that a plate can be made to fit as it should the plaster cast by swaging alone. There are certains portions that, owing to the form of the plate, will always spring in or out; there are certain portions that, owing to unavoidable inaccuracies of the die will need the skillful use of the pliers or the fingers, a few well directed blows of the bench hammer while the plate rests upon the plaster cast to give it the desired accuracy. These delicate manipulations cannot be described, they are acquired by practice and the constant use of thought and judgment. It is surprising how great a change a skilled workman can make in the fitting of a plate by a few minutes manipulation. I have frequently seen plates that when placed in the mouth, while seeming to fit would not hold, and were devoid of the slightest suction, in a few minutes made to hold so firmly as to be painful. In like manner, finished dentures that were supposed to be so badly warped during soldering as to necessitate a remaking, I have frequently seen made by a few well directed blows of the bench hammer to fit the cast and the mouth with perfect satisfaction. This can seldom be done unless the plate has been skillfully swaged, that is always the foundation of an accurate fit.

In conclusion, a solid anvil, I consider essential. A flatiron held on the knees, a tomato can turned on end, or a baby jumper on castors, cannot take its place. Neither do I think, can a workman, however skillful, properly swage a plate sitting on the shop stool, seated in a rocking chair, or swinging in a hammock. He must stand to his work solid and firmly, over an anvil with sufficient heft that its inertia shall resist and absorb the force transmitted to it.

DISCUSSION.

Dr. Howard E. Roberts asked if Dr. Trueman approved of a heavy hammer for swaging?

Dr. Trueman replied he did not like too heavy a hammer, but thought whatever kind was used a *dead blow* without recoil was necessary for proper swaging. There must not be too much hammering otherwise the plate would be stretched. A swaged plate was only the same plate that was cut to the pattern in a different form but of equal thickness throughout. It must not be made thinner at any point, otherwise there would be a spring in it, that could not be gotten out. The hammer should be held about midway between the hammer head

and the end of the handle, or if anything nearer the hammer head, and the hammer should not be permitted to recoil when the blow was struck.

Dr. Chupein asked if he approved of a cone end above the base of the die?

Dr. Trueman said: "Not a cone exactly, but only what could be formed by reversing a casting ring over the base of the die and filling or partly filling this with metal before that which was poured into the sand impression had become chilled. He favored *Zinc* for the die and nothing harder than *Lead* for the counter-die. He disapproved of reswaging plates that had been worn and soldered, and preferred, if the circumstances called for it, to go to the expense of buying new plate, rather than attempting to reswage such a plate. He thought by too much hammering on a die, in the effort to make a plate fit, the plate was stretched as the lead got very hard next the plate and by its contact next the anvil, so that by too much hammering the die was driven against the plate next an unyielding matrix of the lead counter die."

Dr. Bonsall was in full accord with the paper and had nothing to say to any of the points it brought forward. He would say however that he had frequently reswaged plates that had been worn, removing the solder from such, sometimes to the amount of two dwts., and had made better adaptations of such reswaged plates than when they were brought to him for such alterations. He considered that the *best* and *toughest* kind of plate for dental use could be made from *pure gold* alloyed with *pure silver*. His manner or formula for making this kind of plate was to take—as an example—24 dwts. of *pure gold* and add to it 8 dwts. of *pure silver*. This would give you 32 dwts. of gold plate of 18 karat fineness, a manner of making plate which really costs less than the 18 karat gold plate purchased from the dealers, and was much tougher and could be worked with greater ease and without fear of cracking. The formula for any quantity was in like proportion, viz.: divide the quantity of pure gold by 3 to ascertain the quantity of pure silver.

Thus, 3)24 dwts. pure gold

8 dwts. " silver

making—32 dwts. 18 karat plate.

The subject was then passed.

Dr. Roop presented some samples of a lilac pink gutta-percha which was intensely hard yet readily softened over the hot water

bath. It was designed to fill teeth on their masticating surfaces in order to withstand the wear usually observed in other gutta-percha on these surfaces.

DENTAL ASSOCIATIONS.

THE Twelfth Annual Meeting of the Texas Dental Association will be held in Fort Worth, Texas, beginning Tuesday, May 24th, 1892, at 10 o'clock a. m., continuing four days. The executive Committee earnestly request you to attend this meeting. Officers 1891-92: James H. Grant, President, Palestine; A. A. Beville, First Vice-President, Waco; A. E. Brown, Second Vice President, El Paso; Chas. B. Lewis, Secretary, Ennis; J. G. Fife, Treasurer, Dallas; T. L. Westerfield, Curator, Dallas. The Association will hold its session in the Y. M. C. A. Hall, with a room for clinics close at hand. The hotel rates will be from $1 50 to $2.50 per day. All railroads into Fort Worth will give a rate of four cents per mile for the round trip. Tickets on sale May 23rd, good to return until May 28th. Executive Committee—Geo. M. Patten, Chairman, Galveston; W. J. Barton, Paris; J. N. Goolsbee, Crockett. Finance Committee—J. H. Vaughn, Seguin; S. W. Johnson, Llano. Editorial Staff—J. C. Storey, Dallas; W. J. Barton, Paris; T. H. Lipscomb, Galveston; O. B. Love, San Antonio; F. N. Brown, Abilene. Superintendent of Clinics—D. B. Abidill, Chairman, Fort Worth. Committee of Arrangements—A. J. Lawrence, Fort Worth.

THE Twenty-eighth Annual Meeting of the Illinois State Dental Society was held at Springfield, May 10th to 13th, 1892. The following officers were elected for the ensuing year: President, E. R. Blair, Waverly; Vice-President, C. N. Polinson, Chicago; Secretary, Louis Ottofy, Chicago; Treasurer, W. B. Stevens, Chicago; Librarian, F. H. McIntosh, Bloomington. The next meeting will be held at "Rock Island," second Tuesday in May, 1893.

LOUIS OTTOFY, Secretary, Chicago.

A FIRST MEETING of the Pennsylvania and New Jersey State Dental Societies will be held at Cresson Springs, Penna., on July 20, 21 and 22, 1892. The profession is cordially invited to attend. Clinics, exhibits and papers will be unsurpassed in interest.

AT the Annual Meeting of the Chicago Dental Society, held Tuesday evening, April 5th, 1892, the following officers were elected for

the ensuing year: S. W. Wassall, President; Thos. D. Gilmer, First Vice-President; E. A. Royce, Second Vice-President; D. D. Davis, Recording Secretary; Geo. J. Dennis, Corresponding Secretary; E. D. Swain, Treasurer; J. H. Smyzer, Librarian; G. H. Cushing, E. Noyes, J. C. Reid, Board of Directors; A. H. Peck, D. B. Wikoff, D. M. Gallis, Board of Censors.

Geo. J. Dennis, Corresponding Secretary.

The Thirty-second Annual Session of the American Dental Association will be held at Niagara Falls, N. Y., commencing at 10 o'clock a. m., Tuesday, August 2, 1892.

Geo. H. Cushing, Recording Secretary.

The Southern Dental Association meets at Lookout Mountain, Chattanooga, Tenn., July 26th, 1892.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

COMMITTEES AS APPOINTED AND CONFIRMED TO DATE.

General Executive Committee.

Chairman—Dr. W. W. Walker, 67 W. 9th St., N. Y. City; Secretary—Dr. A. O. Hunt, Iowa City, Iowa; Treasurer—Dr. John S. Marshall, 9 Jackson St., Chicago, Ill.; Dr. W. J. Barton, Paris, Texas; Dr. L. D. Carpenter, Atlanta, Ga.; Dr. J. Y. Crawford, Nashville, Tenn.; Dr. M. W. Foster, 9 Franklin St., Baltimore, Md.; Dr. A. W. Harlan, 70 Dearborn St., Chicago, Ill.; Dr. H. J. McKellops, 2630 Washington Ave., St. Louis, Mo.; Dr. G. W. McElhaney, Columbus, Ga.; Dr H B Noble, N. Y. Ave., Washington, D. C.; Dr John C Storey, Dallas, Texas; Dr C S Stockton, Newark, N. J.; Dr L D Shepard, 330 Dartmouth St., Boston, Mass.; Dr J Taft, 7th St., Cincinnati, Ohio.

Committee of Conference for World's Congress Auxiliary.

W D Miller, Berlin, Germany; F Busch, Berlin, Germany; Thos W Evans, Paris, France; E Magitot, Paris, France; G W Sparrock, Lima, Peru; W B Macleod, Edinburgh, Scotland; A W W Baker, Dublin, Ireland; Ernest Sjoberg, Stockholm, Sweden; Charles S Tomes, London, England; W H Coflin, London, England; W Geo Beers, Montreal, Canada; H C Edwards, Madrid, Spain; E Lecaudy, Paris, France; J G Van-Martin, Rome, Italy; Plattschick, Pavia, Italy; Joseph Arkovy, Buda Pesth, Hungary; C Redard, Geneva, Switzerland; W H Morgan, Nashville, Tenn.; W. H. Dwinelle, New York City; R B Winder, Baltimore, Md.; Elisha G Tucker, Boston,

Mass.; W W H Thackston, Sarmville. Va.; J B Rich, Washington, D. C.; J D White, Philadelphia, Pa.; W H Eames, St. Louis, Mo.; J B Patrick, Charleston, S. C.; F J S Gorgas, Baltimore, Md.; G V Black, Jacksonville, Ill.; R Finlay Hunt, Washington, D. C.; E Bacon, Portland, Maine; Benjamin Lord, New York City, N. Y.; A L Northrop, New York City; W W Allport, Chicago, Ill.; W W Walker, New York City; L D Carpenter, Atlanta, Ga.; J Y Crawford, Nashville, Tenn.; W J Barton, Paris, Tex.; J Taft, Cincinnati, O.; C S Stockton, Newark, N. J.; L D Shepard, Boston, Mass.; H J McKellops, St. Louis, Mo.; A O Hunt, Iowa City, Iowa; H B Noble, Washington, D. C.; Geo W McElhaney, Columbus, Ga.; J C Storey, Dallas, Tex.; M W Foster, Baltimore, Md.; A W Harlan, Chicago, Ill.; J S Marshall, Chicago, Ill.

Committee No. 1.

General Finance Committee.

Chairman—L D Shepard, 330 Dartmouth St., Boston, Mass.; T W Brophy, 96 State St., Chicago, Ill.; A L Northrop, New York City.

Committee No. 2.

Programme Committee—Not Appointed.

Committee No. 3.

Committee on Exhibits.

Chairman—Charles Pruyn, 70 Dearborn St., Chicago, Ill.; Arthur E Matteson, 3700 Cottage Grove Ave., Chicago, Ill.; E M S Fernandez, 103 State St., Chicago, Ill.

Committee No. 4.

Committee on Transportation.

Chairman—F H Gardiner, 126 State St., Chicago; V H Jackson, 240 Lenox Avenue, New York City; Geo. Eubank, Birmingham, Ala.

Committee No. 5.

Committee on Reception.

Chairman—W W Allport, 9 Jackson St., Chicago; W W H Thackston, Farmville, Va.; E M S Fernandez, 103 State St., Chicago; Geo A Christmann, Staats Zeitung Building, Chicago; Jas McManus, 32 Pratt St., Hartford, Conn.; Elisha G. Tucker, Boston, Mass.; J D Thomas, 912 Walnut St., Philadelphia, Pa.; H J McKellops, 2630 Washington Ave., St. Louis; L L Dunbar, 500 Sutter St., San Francisco, Cal.; V E Turner, Raleigh, N. C.; Joseph Bauer, 130 Esplanade St., New Orleans, La.; J F P Hudson, 19 West 39th St., New York City; W P Dickinson, 608½ Nicollett Ave., Minneapolis, Minn.; C F

W Holbrook, 34 Park St., Newark, N. J.; W J Foster, 9 West Franklin St., Baltimore, Md.; R M Sanger, East Orange, N. J.

Committee No. 6.

Committee on Registration.

Chairman—Fred A Levy, 343 Main St., Orange, New Jersey; E L Clifford, 401 West Monroe St., Chicago, Ill.; Geo N West, 34 Monroe St., Chicago, Ill.; J Y Crawford, Nashville, Tenn.; C V. Rosser, Atlanta, Ga.; T L James, Fairfield, Iowa; W H Fundenburgh, 323 Pennsylvania Avenue, Pittsburg.

Committee No. 7.

Committee on Printing Transactions.—Not Appointed.

Committee No. 8.

Committee on Conference with State and Local Societies.

Chairman—J Taft, Cincinnati, Ohio.

List of State Committees.

Alabama—E S Chisholm, Tuscaloosa, Chairman: A Eubank, Birmingham: Chas P Robinson, Mobile; G M Rousseau, Montgomery.

Arizona—L N Goodrich, Phœnix, Chairman; D Pentland, Prescott; J Hardy, Phœnix; W Warnekross, Tombstone.

Arkansas—M C Marshall, Little Rock, Chairman; W B Pollard, Hot Springs; L K Land, Pine Bluff; R D Seals, Fort Smith; A E Kimmons, Fort Smith.

California—C L Goddard, San Francisco, Chairman; W J Younger, San Francisco; E L Townsend, Los Angeles.

Colorado—P T Smith, Denver, Chairman; W E Griswold, Denver; H P Kelly, Denver; R B Weiser, Georgetown.

Connecticut—E S Gaylord, New Haven, Chairman; Jas McManus, Hartford; R W Browne, New London.

Delaware—T H Gilpin, Middleton, Chairman; C R Jefferies, Wilmington.

District of Columbia—Henry C Thompson, Washington, Chairman; R B Donaldson; J Hall Lewis; L C F Hugo; H M Schooley.

Florida—J N Jones, Jacksonville, Chairman; James Chace, Ocala; Duff Post, Tampa; I J Welch, Pensacola.

Georgia—S B Barfield, Macon, Chairman; John H Coyle, Thomasville; H H Johnson, Macon; W C Wardlaw, Augusta.

Idaho—E L P Ector, Moscow, Chairman; John H McCallie, Moscow; A Boston, Lewiston.

Illinois—W H Taggart, Freeport, Chairman: C N Johnson, Chicago; J J Jennelle, Cairo.

Indiana—J B Morrison, Indianapolis, Chairman ; P G C Hunt, Indianapolis ; S B Browne, Fort Wayne.

Iowa—C B Peterson, Dubuque, Chairman : S C Hatch, Sioux City ; L K Fullerton, Waterloo.

Kansas—L C Wasson, Topeka, Chairman ; C E Esterley, Lawrence: Wm H Schulze, Atchison.

Kentucky—C G Edwards, Louisville, Chairman; Chas E Dunn, Louisville ; F Peabody, Louisville.

Louisiana—C E Kells, Jr., New Orleans, Chairman ; Joseph Bauer, New Orleans; Andrew G Friederichs, New Orleans.

Maine—D W Fellows, Portland, Chairman; Edmund C Bryant, Pittsfield ; Henry A Kelly, Portland.

Maryland—E P Keech, Baltimore, Chairman ; A J Voick, Baltimore ; Edward Nelson, Frederick.

Massachusetts—D M Clapp, Boston, Chairman ; W H Potter, Secretary ; Eugene H Smith, Boston ; L D Shepard, Boston : S G Stevens, Boston ; D B Ingalls, Clinton ; R R Andrews, Cambridge : Geo A Maxfield, Holyoke ; James H Daly, Boston.

Michigan—C S Case, Jackson, Chairman ; Geo L Field, Detroit ; F L Owen, Grand Rapids.

Minnesota—T E Weeks, Minneapolis, Chairman ; M G Jenison, Minneapolis ; C H Robison, Wabasha.

Mississippi—Morgan Adams, Sardis, Chairman ; R K Luckie, Holly Springs : J D Miles, Vicksburg ; G B Clements, Macon.

Missouri—C L Hungerford, Kansas City, Chairman : A H Fuller St. Louis ; J D Patterson, Kansas City.

Montana—C S Whitney, Miles City.

Nebraska—H T King, Fremont, Chairman ; A W Nason, Omaha, H C Miller, Grand Island : H J Cole, Norfolk ; I W Funck, Beatrice.

Nevada—A Chapman, Virginia City, Chairman ; M A Greenlaw, Reno ; S S Southworth, Carson City.

New Hampshire—C W Clements, Manchester, Chairman : G A Young, Concord ; Wm Jarvis, Claremont ; W R Blackstone, Manchester ; C H Hayward, Peterborough ; B C Russell, Keene.

New Jersey—S C G Watkins, Mont Clair, Chairman ; B F Luckey, Paterson ; R M Sanger, E. Orange ; Charles A Meeker, Newark.

New York—John I Hart, New York City, Chairman ; K C Gibson, New York ; W Carr, New York ; M L Chaim, New York : Chas, Butler, Buffalo ; F A Remington, New York.

North Carolina—V E Turner, Raleigh, Chairman ; J H Durham, Wilmington ; J F Griffith, Salisbury.

North Dakota—S J Hill, Fargo, Chairman ; S P Johnson, Grand Forks ; W O DePuy, Bismarck ; H S Sowles, Wahpeton ; E M Pierce, Hillsboro.

Ohio—D R Jennings, Cleveland, Chairman ; H F Harvey, Cleveland ; M H Fletcher, Cincinnati ; L E Custer, Dayton ; A F Emminger, Columbus.

Oklahoma Territory—D A Peoples, Guthrie, Chairman ; G F Dean, Oklahoma City ; J S Nickolson, El Reno.

Oregon—S J Barber, Portland, Chairman ; E G Clark, Portland ; J R Cardwell, Portland.

Pennsylvania—L A Faught, Philadelphia, Chairman ; C S Beck, Wilkesbarre ; J A Libbey, Pittsburg.

South Carolina—Thos T Moore, Columbia, Chairman ; W S Brown, Charleston ; A P Johnstone, Anderson ; B H Teague, Aiken.

South Dakota—O M Huestis, Aberdeen, Chairman ; C W Stutenroth, Watertown ; F W Blomily, Sioux Falls.

Tennessee—H W Morgan, Nashville, Chairman ; B S Byrnes, Memphis ; W H Richards, Knoxville ; H E Beach, Clarksville.

Texas—W R Clifton, Waco, Chairman ; G M Patton, Galveston ; Tom Robinson, Houston ; Geo S Staples, Sherman ; T L Westerfield, Dallas ; H J McBride, Tyler.

Utah—A S Chapman, Salt Lake City, Chairman ; A B Dunford, Salt Lake ; F W Baker, Ogden.

Vermont—G F Cheney, St. Johnsbury, Chairman ; Thomas Mound, Rutland ; R M Chase, Bethel.

Virginia—J Hall Moore, Richmond, Chairman ; W W H Thackston, Farmville ; Jos R Woodley, Norfolk ; E P Beadles, Danville ; T H Parramore, Hampton ; D W Rust, Alexander.

Washington—W E Burkhardt, Tacoma, Chairman ; F P Hicks, Tacoma ; J C Grasse, Seattle.

West Virginia—H H Harrison, Wheeling, Chairman ; Jno H McClure, Wheeling ; H K Jones, Parkersburg ; George I Keener, Grafton ; J N Mahan, Charleston.

Wisconsin—B G Marcklein, Milwaukee, Chairman ; C C Chittenden, Madison ; George H McCausey, Janesville.

Wyoming—Waiting for nominations.

Committee No. 9.

Committee on the History of Dental Legislation in this and Other Countries.

Chairman—William Carr, New York City, N. Y. ; Paul Dubois, 2 Rue d'Amsterdam, Paris ; F Busch, Berlin, Germany ; J H Mum-

mery, London, England: M Etcheparaborda, Buenos Ayres, South America.

Committee No. 10.

Auditing Committee.

Chairman—L D Shepard, Boston, Mass.; R R Andrews, Cambridge, Mass.; Chas. A Meeker, Newark, N. J.

Committee No. 11.

Committee on Invitation.

Chairman—W C Barrett, 208 Franklin St., Buffalo, N. Y.; E. T. Darby, 1513 Walnut St. Philadelphia, Pa.; S G Perry, 46 West 37th St., New York City; W C Wardlaw, Augusta, Ga.; S W Dennis, 81 Flood Building, San Francisco, Cal.; J D Patterson, Kansas City, Mo.

Committee No. 12.

Committee on Membership.

Chairman—Edmund Noyes, 65 Randolph St., Chicago, Ill.; B. F. Luckey, Paterson, N. J; E S Chisholm, Tuscaloosa, Alabama, C M Bailey, 28 Syndicate Block, Minneapolis, Minn.; Dan'l N. McQuillen, 1628 Chestnut St., Philadelphia, Pa.

Committee No. 13.

Committee on Education and Literary Exhibits.

Chairman—J J R Patrick, Belleville, Ill.; J Y Crawford, Nashville, Tenn.; A H Fuller, 2602 Locust St., St. Louis, Mo.; C A Brackett, 102 Truro St, Newport, R. I.; B H Catching, Atlanta, Ga.

Committee No. 14.

Committee on Clinics in Operative Dentistry and Oral Surgery.

Chairman—C F W Bodecker, 60 East 58 St., New York City; S C G Watkins, Montclair, N. J.; John S Marshall, 9 Jackson St.; Chicago, Ill.; Arthur B Freeman, 325 West Madison St., Chicago, Ill.; H H Schumann, 240 Wabash Ave., Chicago, Ill.; Henry W Morgan, Nashville, Tenn; William Crenshaw, Atlanta, Ga.

Committee No. 15.

Committee on Prosthetic Dentistry.

Chairman—S H Guilford, Philadelphia, Pa.; L P Haskell, 2111 Wabash Ave., Chicago, Ill.; A P Johnstone, Anderson, South Carolina; W N Morrison, St. Louis, Mo.; Fred C Barlow, 646 Jersey Ave., Jersey City; J Hall Lewis, 1309 F St., N. W., Washington, D. C.; A O Hunt, Iowa City, Iowa; R R Freeman, Nashville, Tenn., E S Gaylord, New Haven, Conn.

Committee No. 16.

Local Committee of Arrangements.

Chairman—E S Talbot, 125 State St., Chicago, Ill; F H Gardiner, 126 State St., Chicago, Ill.; C N Johnson, Opera House Building, Chicago, Ill.; D B Freeman, 4000 Drexel Boulevard, Chicago, Ill.; H J McKellops, 2630 Washington Ave., St. Louis, Mo.

Committee No. 17.

Committee on Essays.

Chairman—E C Kirk, Philadelphia, Pa.; J W Wassall, Chicago, Ill; A H Thompson, Topeka, Kansas; H H Johnson, 26 2d St., Macon, Ga.; L G Noel, Nashville, Tenn.

Committee No. 18.

Committee on History of Dentistry in the United States.

Chairman—J Taft, Cincinnati, Ohio: Louis Jack, 1315 Locust St., Philadelphia, Pa.; F T VanWort, Brooklyn, N. Y.; F J S Gorgas, Baltimore, Md.; H L McKellops, 632 Sutter St., San Francisco, Cal.; E G Betty, Cincinnati, Ohio; J B Patrick, Charleston, South Carolina,

Committee No. 19.

On Nomenclature—Not Appointed.

Committee No. 20.

Committee to Promote the Appointment of Dental Surgeons in the Armies and Navies of the World.

Chairman—M W Foster, Baltimore; B Holly Smith, Baltimore; Geo Cunningham, Cambridge, England; De Gallippe, Paris; Adolph Weil, Munich; Jno E Gievers, Amsterdam, Holland; E DeTrey, Vevey, Switzerland; A Szigmondy, Vienna; O Mela, Geneva, Italy; V Haderup, Copenhagen; O J Chrustchow, St. Petersburg, Russia; Alex McG Denham, Monjitas 68½, Chili; Geo B Newland, 107 Calle Florida, Buenos Ayres.

Committee No. 21.

Committee on Care of the Teeth of the Poor.

Chairman—W J Barton, Paris, Texas; C A Brackett, Newport, R. I.; T C Ingersoll, Erie, Pa.; W M Fisher, Dundee, Scotland.

Committee No. 22.

Committee on Biology and Bacteriology.

Chairman—R R Andrews, Cambridge, Mass.; M H Fletcher, Cincinnati, Ohio; W X Sudduth, Minneapolis, Minn; W D Miller, Berlin,

Germany; J H Mummery, London, England; D E Caush, Brighton, England; E Magitot, Paris, France: M Morgensten, Baden Baden, Germany, Geo S Allen, New York City, N. Y.

Committee No. 23.

Committee on Prize Essays.

Chairman—Theo Stanley, Kansas City, Mo.; C S Stockton, Newark, N. J.

Committee No. 24.

Editorial Committee.

Chairman—W W Walker, New York City; A O Hunt, Iowa City: L D Shepard, Boston; J Taft, Cincinnati; J S Marshall, Chicago.

Committee No. 25.

Nominating Committee.

Chairman—W W Walker, New York City; A W Harlan, Chicago, Ill.; John S Marshall, Chicago, Ill.

TREATING ROOT CANALS.

By Dr. G. V. Black.

We will suppose that a patient comes for any necessary operations, and find one or more dead pulps in teeth that have given no pain, a kind of case that is frequent enough. When this fact is determined, put on the rubber dam. Disinfect the crown of the tooth and the cavity by first cleansing same, and then washing well with 1, 2, 3 mixture. (This mixture is composed of carbolic acid, 1 part; oil of cassia, 2 parts; oil of wintergreen, 3 parts.) I use this on a swab of cotton, also cotton wisps drawn between the teeth. Open into root canals and get good access before trying to enter them in all cases. If they are empty put in a little cotton saturated with 1, 2, 3, and seal up cavity with gutta-percha, having moistened walls of cavity with oil of eucalyptus to make gutta percha cohere. If canals contain debris, moisten broach in 1, 2, 3, and remove main bulk, being careful not to reach apical foramen, and careful not to punch anything through; apply 1, 2, 3 on cotton, and seal up as before. In either case, discharge the patient for one week, with instructions to report sooner if any trouble. In case there is fistulous opening, apply dam as before, and disinfect. Open into canals and clean thoroughly, getting good opening through apical foramen if possible, but do not drill through. Wash with sulphuric ether, pumping it through with cotton on broach where I must, but not driving it through with a syringe where I can; sometimes use peroxide of

hydrogen instead of sulphuric ether. In case I cannot get through apical foramen, I make the best possible cleansing of canals, apply 1, 2, 3 in canals on cotton, seal up, discharge the patient for a week to wait development. I do this also with cases in which I do get through and wash out.

Blind Abscess.

In case of blind abscess, when I find pus in canals and no fistulous opening, I call it blind abscess, provided it is not acute. Before this is learned, I have applied the dam and have disinfected. (The dam is always applied before opening into a pulp chamber.) Clean the canals thoroughly and drain away all pus possible. When there seems to be much pus, pump in peroxide of hydrogen first, or simply wash canals with ether. In these cases I often pump in pure oil of cassia, using cotton on a broach, but sometimes use carbolic acid 95 per cent., and again the 1, 2, 3. Then seal up cavity with gutta-percha for a week, giving careful instructions to patient to repeat at any time if there is trouble. In all of these cases, if all has gone well, I fill the canals at the next sitting, put on the dam and disinfect before removing gutta percha.

When Arsenic is Applied.

In case arsenious acid has been used to destroy pulp. When pulp is drawn away whole, moisten canals with eucalyptus and fill immediately. The dam was on when the arsenic was applied, and the arsenic sealed in with gutta-percha. The dam was on and the tooth and surroundings disinfected before the gutta-percha was removed. In case the pulp breaks up into shreds, making it difficult and doubtful about getting canals well cleaned, seal up for a week, leaving cotton with 1, 2, 3 in canal. Then remove this, dam on, surroundings disinfected, and fill root. The cotton generally brings away what debris there may have been left in canal. In any case in which a tooth has become sore to the touch, while arsenious acid is in cavity, the filling of root is delayed, even if the pulp comes out clean. I think it a good rule never to fill a root canal while the tooth is sore. This is what may be termed my routine treatment. In all these cases I fill the root at the second sitting, if all has gone well. When pain has arisen, or discharge of pus continues, further time and treatment is required, and the case gets out of the routine method, and must be treated according to the conditions. Sometimes a simple change of dressing and another week's probation is all that is wanted. Sometimes the medication is forced. Pure oil of cassia may be found necessary in the abscess cavity to disinfect and arouse some irrita-

tion or excitant effect. I may use 95 per cent. carbolic acid, forcing it through the fistula. This keeps the fistula open longer, and makes them larger for a time, giving better drainage; or, again, when some very mild measures will force eucalyptus into the abscess after washing with ether or peroxide of hydrogen. Cases come now and then in which I make a wide cut from the outside to make free drainage. In fact, these cases that don't get well readily lead to great variety of treatment to meet the special conditions.—*Catching Compendium.*

Iodine and Glycerine.

Tincture of Iodine, mixed with glycerine, is claimed by Dr. Hammond to be more effective as a local application than the plain tincture. This is due to the retardation of the dissipation of the iodine, or more likely to the skin remaining soft, and, therefore, in a better condition for absorbing the drug.—*Catching Compendium.*

NERVE PASTE.

Dr. E. C. Kirk.

None of the formulas for arsenical paste gives as good satisfaction as a combination of arsenic and Robinson's Remedy; make a stiff paste and work it into cotton fibers, which is loosely twisted and cut into pieces the size of mustard seed.—*Catching Compendium.*

Removing Pulps.

For removing the pulp, after removing the arsenious acid, antiseptically cleanse the cavity and apply a little of the following:

℞ Tannic Acid.................................. grs. x.
Glycerine .... drachm 1.
M.

This application will contract the tissues and render their removal easy.—*Catching Compendium.*

BOOK NOTICES.

Perfect Vulcanite Or Solid Rubber and Whole Sections. By W. G. Baker, Sandy Creek, N. Y. News Book and Job Print, 1892.

We have received a copy of the above pamphlet from the author, who writes in the interests of those who have had trouble with porous dental plates and cracked block sections, which he proposes by the instructions given, to entirely avoid. The directions given are clear, briefly told, and scientifically reasoned, and the contents, if faithfully carried out, will result to the advantage of both patient and operator. The work is sold at $1.50 by the author, Pulaski, N. Y.—[Ed.

IMPORTANT NOTICE AND REMOVAL.

THE PRACTICAL PLACE.

TREATMENT FOR RAPIDLY DECAYING TEETH.

Use always aids in health and development. Disuse is a predisposing cause of decay in the teeth. In my practice I have always advised my patients, where they had teeth decaying rapidly, to eat their food as dry as possible, to masticate it thoroughly, and to give the teeth as much use as they could, and that little advice to my patients has been of great assistance to me and of very great advantage to the patients themselves.—*Dr. Peirce, quoted in The Ohio Journal of Dental Science.*

PASTE FOR LABELS.

A good paste is made by soaking flake tragacanth in sufficient cold water that the brush will not sink into the paste when finished. To prevent souring, add to the water 2 grains of hydronaphthol (dissolved in a little alcohol) for each pint, and a few drops of clove oil for scent. To keep away the flies add some oil of pennyroyal. Avoid in making pastes oil of wintergreen and carbolic acid, for these produce a purplish discoloration by contact with the tinned iron of the brush.

To REMOVE rust stains from nickel plate, grease the rust stains with oil, and after a few days rub thoroughly with a cloth moistened with ammonia. If any spots still remain, remove them with dilute hydrochloric acid and polish with tripoli.

THE

Dental Office and Laboratory.

FOURTH SERIES.

Vol. VI. PHILADELPHIA, SEPTEMBER, 1892. No. 5.

FOURTEENTH PAPER.

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 106, Vol. VI, No. 4.)

CHARGES.

Charges by the hour or the time occupied for the operation seems to be the most equitable to both parties, and this plan is the only one likely to solve the problem, which patients do not, or will not, understand—the treatment of diseased teeth previous to filling. Such cases require at times protracted treatment before ultimate root and crown filling, and it is but fair that the operator should be paid for the time consumed on the case. Again there are certain cavities which are wearing to both patient and operator, and would cause distress or shock to the former if all were done at one sitting, as for instance in the case of a large compound cavity which would require considerable preparation to get it ready for filling. In such cases it would be better to prepare such a cavity at one sitting and fill at another, than to consume two hours or more in the effort at completion. In this way, also, a more thorough preparation of the cavity is given than if the whole operation is pushed to completion at one sitting. On the other hand, if two small cavities in the crown or other surface of a tooth can be well accomplished within the time of the appointment, it is but just that the patient should receive the benefit and only pay for so much time. It would not be fair to charge for *the time* in one case, and for *the operation* in another. The question of charges, however, is one that is difficult to reconcile, some persons preferring to pay for so many fillings rather than for so much time, so that it is therefore best for each operator to suit the whim or ideas of his patient, and make the necessary calculations in his estimate as to what would be fair to himself and his patients.

NOTIFYING PATIENTS.

The visit to the dentist is always an unwelcome one, and patients, despite every resolution to the contrary, will only make such when driven by pain to do so. The care of the *teeth* is different from the care of the *health*. One only sends for the physician when sick or suffering. But when suffering with tooth ache this is a bad time to visit the dentist, if the best service or the preservation of the teeth is desired. The violence of pain from dental decay is most generally caused when the tooth is so nearly consumed by caries as to call for operations which are alike distasteful to the operator, and not the best for the patient, viz: the devitalization of the nerve. It is only when decay has made but comparatively inconsiderable inroad into tooth tissue, that the *best* operations can be performed, and such is not the case when severe toothache is felt. All patients will make the firm resolution "not to let it be so long" before visiting the dentist, after they have had their teeth put in order. But such resolutions are like "pie crust," and two, three, or four years will often elapse before another visit is voluntarily made.

To avoid the wholesale destruction of teeth, to serve their patients' best interests, and to save themselves very many difficult, tedious and wearing operations, which at best are not always entirely satisfactory to the operator, yet are the best that may be done from the condition of affairs, many operators have lately adopted the plan of *notifying their patients when they should come.* This plan, although it may have the look of being mercenary, or of seeking to drum up patients, is one that suits such persons who are worth having as patients, and these are pleased to have the burden of *remembering* when to go to the dentist shifted from their shoulders. It is customary then, with many dentists, to have *two diaries*, and after having completed for the patient to put his or her name and address down in one of these, at a certain *hour* and *date*, three or six months in advance, accordingly as he thinks the patients' teeth need watching.

At the beginning of the year these names are copied in the *new diary* and *each week* postals are sent to the different patients notifying them of the day and hour of their appointment. By this plan a clientelle is established, patients come regularly, their teeth are watched and extensive decay thwarted, the responsibility of their loss is, to a great measure shifted from their shoulders, their bills are comparatively light, since the amount of work, by such a plan, is necessarily small, there are few or no new cases, and often no severe toothache, so that when the plan is once established, it works to the satisfaction of all concerned.

NOMENCLATURE.

It is important to write so intelligently that each one who reads what is written may understand exactly what is meant by the writer. It is likewise important that a nomenclature should be so precise as to leave no doubt as to what is meant.

A tooth has several surfaces and each surface distinguishing points.

Beginning with the central incisors we have the *Mesial* surface, which is the surface *nearest* the middle of the mouth. The *Distal* surface, that surface *farthest* from the middle of the mouth. The *Labial* surface, the surface next the lips. The *Lingual* surface, the surface towards the tongue. Then we have the *Cutting* edge and the *Labial grooves.* The *Mesial Angle*, which is the angle formed by the mesial surface and the cutting edge. The *Distal Angle*, which is the angle formed by the distal surface and the cutting edge. Looking at the tooth on the inside we have the *gingival ridge*, which is a prominence of the tooth near the gum. The *Mesial marginal ridge*, a prominence or ridge near the Mesial surface. The *Distal marginal ridge*, a ridge near the distal surface, and the *Lingual pit*, which is a depression beneath the gingival ridge between the Mesial and Distal ridges. Fig. 206, A, the Mesial surface; B, the Distal surface; C, the Labial

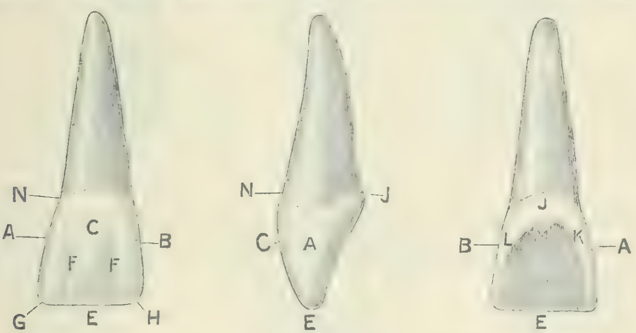

FIG. 206 A.

surface; D, the Lingual surface; E, the Cutting edge; F, F, the Labial grooves; G, the Mesial angle; H, the Distal angle; J, the Gingival ridge; K, the Mesial marginal ridge; L, the Distal marginal ridge; M, the Lingual pits; N, the Gingival line.

It will be needless to go over the description of these different surfaces, so that we will simply give a cut of each tooth, and the letters appended to the cut will indicate the different surfaces. Fig. 207 represents an upper lateral incisor, A, the Mesial surface; B, the Distal surface; C, the Labial surface; D, the Lingual surface; E, the

cutting edge; F, F, the Labial grooves; G, the Mesial angle; H, the Distal angle; J, the Gingival ridge; K, the Mesial marginal ridge;

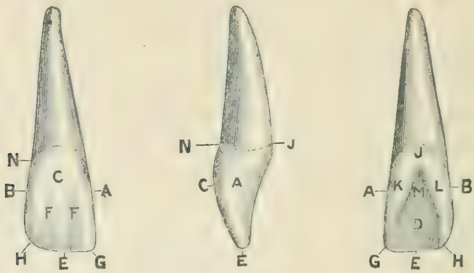

FIG. 207.

L, the Distal marginal ridge; M, the Lingual pit; N, the Gingival line. Fig. 208 represents an upper cuspid. A, the Mesial surface;

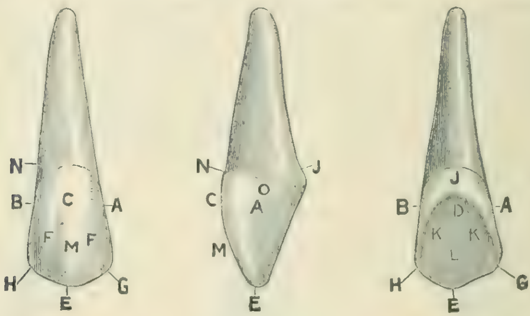

FIG 208.

B, the Distal surface; C, the Labial surlace; D, the Lingual surface; E, the Point of the cusp; F, the Labial grooves; G, the Mesial angle;

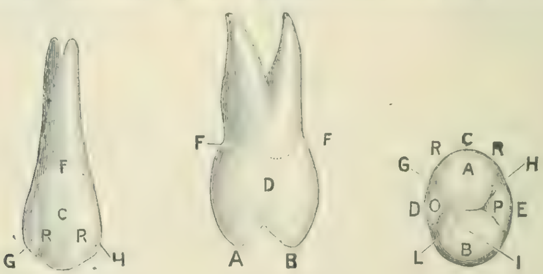

FIG. 209.

H, the Distal angle; J, the Lingual gingival ridge; K, the Lingual grooves; L, the Lingual ridge; M, the Labial ridge; N, the Gingival Line; O, Mesial depression. Fig. 209 represents an upper first

bicuspid. A, the point of *buccal* cusp; the Lingual cusp; C the Buccal ridge; D, the Mesial surface; E, the Distal surface; F, the Gingival line; G, the Mesial angle; H, the Distal angle; I, the Triangular ridge of lingual cusp; L, the Central groove; O, the Mesial groove; P, the Distal groove; R, Buccal grooves. The whole occluding part is termed the masticating surface. Fig. 210 represents

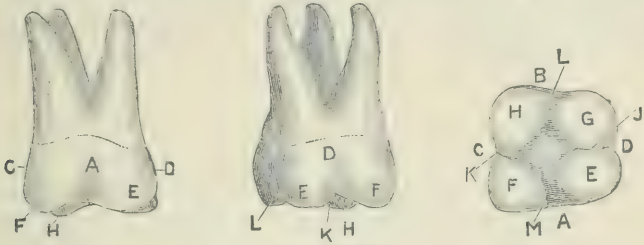

FIG. 210.

an upper molar tooth. A, the Mesial surface; B, the Distal surface; C, the Buccal or Labial surface; D, the Palatal or Lingual surface. The whole area of the cusps, fissures, &c., is termed the masticating surface; E, the mesio-lingual (or palatal) cusp; F, the mesio-labial (or buccal) cusp; G, the disto lingual (or palatal) cusp; H, the disto-labial (or buccal cusp; J, the lingual (or palatal) groove (or fissure); K, the labial (or buccal) groove; L, the distal groove; M, the mesial groove. Fig. 211 represents a lower first molar. A, the Mesial surface; B, the Distal surface; C, the Labial (or buccal) surface; D, the Lingual surface; E, the mesio-buccal groove; F, the disto-buccal

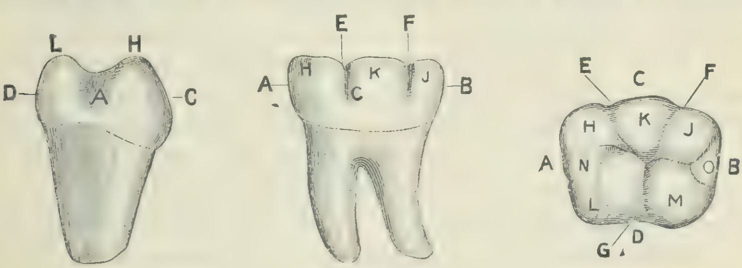

FIG. 211.

groove; G, the Lingual groove; H, the mesio-buccal cusp; J, the Distal cusp; K, the disto-buccal cusp; L, the mesio-lingual cusp; M, the disto-lingual cusp; N, the Mesial groove; O, the Distal groove.

It is important to know the points, grooves, ridges, cusps and surfaces, so that in locating a filling in the case book, the exact locality may be indicated by words. It is true that with the system of

diagrams which is now most generally adopted in dental ledgers, the locality of a filling or indeed of any operation may be accurately described, so that it may be shown to a patient and these are made to comprehend the operation perfectly, yet there are many operations that are performed, in which the operator desires to make a particular or special record, so that in the future a reference may be made to it, and the manner in which it is performed made known to him. For the better understanding of this we make an ideal change of several operations in the case book, to which it is transferred to the Dental Ledger.

June 9, 1891.—Miss Jane Conover, 873 Vanilla St. Reference—Wm. J. Kemp, 437 William St. Filled with gold the R. I. (right inferior) first molar on the central part of its mas. (masticating) surface $5.00. (There was a very deep and sensitive cavity, with, I judge, only a thin septum of dentine over the pulp; covered the entire floor of the cavity with phosphate cement to prevent thermal shock. Extracting the root of the R. S. (right superior) third molar, $1.00. $6.00.

June, 10.—Miss Jane Conover. Filled the L. S. (left superior) lat'l (lateral) incisor R. & C. (root and crown) root at the apex with oxychlo-zinc and crown on its entire disto-palatal aspect with gold, contoured, $10.00. Cleaning tartar from all the teeth, $3.00. $13.00.

June, 18.—Miss Jane Conover. Filled with gold the R. S. 1st bicuspid on its disto mas. (masticating) surface, $5.00. Used Brophy matrix, and packed non-cohesive gold over the entire cervical wall. Filled with premium G. P. (gutta percha) the R. S. 2 bicus a small cavity on its mesial surface, $1.50. Inserting an all gold crown on the remains of the root of the L. S. (left superior) 1st molar roots treated and filled, $12 00. (Could not get into the anterior buccal root very far.) Filled with copper amalgam (a desperate case) the L. I. (left inferior) 3rd molar over its entire mas. buccal and part of lingual surfaces, $2.00; very little of the crown left. $21.50.

June 23.—Miss Jane Conover. Filled with extra amalgam the L. I. (left inferior) 2nd molar on its buccal surface, $2.00; with Dawson's amalgam the L. I. 1st molar on its mas. (masticating) surface near its distal edge, $2.00; and the R. I. (right inferior) 2nd molar on its buccal surface, $2.00, and with Standard Amalgam the L. S. (left superior) 2nd molar on the anterior part of its mas. (masticating) surface, $2.00. And with gold the R. S. (right superior) lat. (lateral) incisor in its lingual pit, $3.00.

In transferring the above from the case book to the dental ledger, the

charge would appear as shown in Fig. 212. By having the word "Remark" placed after the charge, in referring to the case in the dental ledger, at future time, the date will indicate where the original charge was made in the "case book," and in this way a complete history of all that was done, and how it was done, will be indicated. It will also be seen that the different kinds of material is also recorded. By doing this, a data is also obtained of how each kind of materials works, how it preserves the teeth, whether it discolors or holds its color, &c., &c., &c.

FIG. 212.

Name, Miss Jane Conover,

Residence, 873 Vanilla Street.

Reference, Wm. J. Kemp, 437 William Street.

1892		*Operation*		No. on Diagram	Time Hours	Price	*Dr.*	*Cr.*
June 9,	1	Large Gold Filling,	(Remark)	1	1		$5 00	
" 9,	1	Tooth Ext.		2			1 00	
" 10,	1	R. and C. Filling,	(Remark)	3	2		10 00	
" 10,		Cleaning the Teeth,			3/4		3 00	
" 18,	1	Compound Gold Filling,	(Remark)	4	1 1/4		6 00	
" 18,	1	Premium G. P. Filling,		5	1/4		1 50	
" 18,	1	All Gold Crown,	(Remark)	6	4		12 00	
" 18,	1	Aimes' Copper Amalgam Filling,	(Remark)	7	1/2		2 00	
" 23,	1	Extra Amalgam Filling,		8			2 00	
" 23,	2	Dawson's Amalgam Fillings,		9	2		4 00	
" 23,	1	Standard Amalgam Filling,		10			2 00	
" 23,	1	Gold Filling,		11	3/4		3 00	

REPLANTING THE TEETH.

This operation consists in replacing into the same socket the tooth which had been accidentally knocked out or become loosened by accident, or which was removed with the view of cure of an alveolar abscess.

In the former case the tooth is placed into a cup or vessel of tepid water and perfectly cleansed of all dirt or particles which may be adhering to it. The socket should be cleansed of its adherent clot or

blood by means of a probe wound around with cotton. As soon as this is done the socket should be packed with a tent of cotton, which is permitted to remain in place until the tooth is ready to be inserted.

When the tooth is ready to be inserted in its socket, a small dental syringe is charged with tepid water, the tent of cotton is removed from the socket, and the contents of the syringe squirted into the socket, and the tooth immediately inserted. While an assistant holds the tooth in place, a piece of waxed ligature silk is passed in and out in the form of the figure 8, as shown by Fig. 213, and the tooth thus ligated in place to the adjoining teeth.

FIG. 213.

Sometimes there is a disposition on the part of a tooth, thus inserted, to *droop* or be *slightly lower than its neighbors.* To overcome this it has been proposed to cut a small piece of rubber dam, as shown in Fig. 214, and to place this over two neighboring teeth on either side of the one inserted, and to ligate this to the adjoining teeth, so that the elasticity of the rubber will keep the inserted tooth in its proper alignment and position.

FIG. 214.

In the case where a tooth has been considerably loosened, but not entirely knocked out, a splint may be made of a piece of base plate gutta percha; holes may be made through this with a sharp straight-pointed heated instrument. Ligature silk is passed through as shown by Fig. 215, when it is applied as shown in the cut, and left in place until the tooth becomes firmly fixed in its socket.

FIG. 215.

Should there be a disposition to inflamation after such accidents, the gums may be painted with a camel hair pencil, with a solution of

equal parts of glycerine, tinct. iodine and tinct. aconite; but where there is considerable swelling of the gum from a great congestion of blood to the parts, leeches should be applied.

In the case where a tooth is replanted for the cure of alveolar abcess the procedure is as follows: The tooth must be carefully extracted. Ordinarily this is not difficult since teeth thus affected are found to be considerably loosened. To avoid breaking the enamel, in any of the six upper front teeth, the beaks of the forceps may be padded by two or three thicknesses of muslin. This will permit a sufficient grip of the forceps, and lessen the chances of fracture of the enamel at the cervix, where it is quite thin.

When the tooth is removed it is placed in a saucer of tepid water. A few drops of the tincture of iodine may be added to the water. The socket is then wiped out with a probe on which cotton is wrapped. The "cul de sacque" at the bottom of the socket, where the pus bag at the end of the root lies, should be entered with an oval or round cavity bur, or spear pointed drill, in the dental engine, and the remains of cyst broken up. The debris are then washed out by repeated syringing with tepid water, and the socket packed tightly with cotton steeped in the tincture of iodine.

The tooth is then cleansed of all traces of the abscess, and the end where the sac adhered to the peridental membrane is amputated. All adherent particles of tartar are also removed. In doing this the tooth should be held between the fingers with a small napkin interposed. The root canal is then cleansed, and the nerve chamber and root filled from the root opening. The amputated root as well as the filling are nicely smoothed and burnished, and the tooth again placed in the saucer of tepid water. The cotten tent is then removed from the socket. It is again syringed with tepid water, and the tooth immediately replaced with firm pressure. The tooth may be held in its position for a short time when it is ligated as shown by Fig. 213, or should it droop, by the plan advised and illustrated by Fig. 214. The patient should be directed to use an astringent mouth wash of which the following from Dr. Gorgas's Dental Medicine will serve:

℞ Carbolic acid (cryst)
Glycerine and rice water, aa........... 2 drachms.
Mix.

Use five to eight drops in a wine glass of water.

TRANSPLANTATION.

This operation consists of inserting a foreign tooth, or the tooth of another person into the socket of one that has been extracted. The

operation is attended with a certain amount of risk and difficulty, since disease may be transmitted by it. And again it is difficult to obtain the tooth that is to be supplied, of the same shape, size and shade, as the one extracted, or where the root is of the proper length or bulk, neither too large nor too small, too long or too short. If the root be smaller than the socket it would answer, but if too large it would not do to reduce it by filing to make it fit, for by so doing the peridental membrane would be destroyed. If the root be a trifle too short, this would be no impediment, and if it be too long it would be no harm to amputate the end of the root.

When all these considerations are satisfied the operation may be performed, and is accomplished in the manner already set forth for the operation of *replantation.*

The curvature of the crown, the width, length, character, and many other points have to be thought of in the selection of a tooth for transplantation.

IMPLANTATION.

The operation of implantation consists of drilling or forming a socket or cavity in the bone where no socket exists, and implanting therein a tooth recently extracted, or one which had been extracted for a length of time before.

Like transplantation it is attended with risk from the transmission of disease.

Dr. W. J. Younger, of California, first proposed and performed the operation.

It consists of drilling an artificial socket in the bone with the view of inserting therein a tooth which has been lost.

The gum and periosteum are first removed by means of a cylindrical knife in the dental engine. This while being violently rotated is pressed on the gum down to the bone in the locality where the tooth is to be implanted. This removes these tissues so quickly that it may be said to be almost painless. The socket is then drilled with instruments called "spiral knives," to which collars are attached to indicate the depth to which the drilling is to be carried, but the same may be accomplished with a spear shaped drill, although the spiral knives, being formed somewhat to the shape of the root leaves the socket very nearly of such shape as is needed. With conical reamers used with a swaying motion, the shape of the socket can be pretty nearly made of the proper form. The spiral knives cut the bone with great rapidity, and without pain. All the instruments used are kept in a bath of a solution of bichloride of mercury of a strength of two

parts of the drug to one thousand parts of water, and at a temperature of 110° F for a quarter of an hour at least before using them. The tooth also is kept in the same solution. The end of the root is slightly amputated and the pulp renewed, and the root and nerve chamber cleansed and filled. It is then re-immersed before insertion, and when all is ready it is inserted. The tooth may be tried in the socket which has been drilled for it, to see if the size, depth and alignment are correct, when it is inserted, and ligated to the adjoining tooth until perfect adhesion takes place.

The utmost cleanliness must be observed in sterilizing all the instruments, and the hands should be washed and the nails scrupulously cleansed and disinfected, with proper antiseptic washes, before commencing the operation.

The operation " savors of the marvelous," and great results should not be expected of it. Being one which is comparatively young—younger, indeed, than almost any operation in dentistry—the data of its successful performance are so comparatively few, that we must give it more time before we can say " it has come to stay."

[TO BE CONTINUED.]

A HIGHER STANDARD IN DENTISTRY.

BY WALTER H. NEALL, D. D. S.

AN old adage has it that " there is nothing new under the sun," with the accepted meaning, that when one has introduced something which he thinks is stamped with the brand of newness, lo! and behold, when it is divested of its technical phrases and fresh appearing habiliments, it is found to be decidedly ancient and musty, though in new dressings and trimmings. The writer is somewhat in the position of the small boy, who, fond of piscatorial recreation, essayed to fish in a pond which had the reputation of having been fished out.

Hour after hour he sat, but without the pleasurable sensation of a bite. Suddenly a bright idea struck him and was immediately put into execution. His brother, a little tot, was playing by his side. He was seized and thrown into the water, and was skilfully angled after by the enthusiastic fisherman, with intense pleasure and gratification, and triumphantly landed, much to the anger of the unwilling subject, and the consternation and horror of the parents, who, witnessing the affair from a distance were powerless to interfere.

So it is with matter relating to dentistry; the waters have been pretty well fished out, and the only means available for investigation,

instruction, and debate is to cast something old, yet fruitful, into the stream of thought, and then proceed to draw it out again, oblivious to the criticism it may create.

The title of this paper might be misleading, but the idea is, not that dentistry is struggling to gain a position of recognition and prominence; not at all, it has already reached a proud and honorable position, but in looking backward and viewing its many steps, through various grades, each one, apparently, the length to which it was possible to attain, but still going upward and upward; why not, at this stand-point, with all eagerness, look forward to other victories and achievements? We are doing now what were deemed impossibilities twenty-five years ago; why not pave the way for impossibilities, seemingly, to be accomplished twenty-five years hence?

No! Dentistry is not at low ebb; far from it, but there are yet more worlds to conquer. and the higher we pitch our standard, the greater and vastly superior will be the work performed.

That our profession has not yet reached idealism, must be admitted; there is a great deal of room for improvement that can only be accomplished through a thorough training of patient, student, and dentist.

This is a desideratum that persistent effort on the part of the dental profession, as an unit *only*, can hope attain.. But dentists are peculiar individuals, and whilst agreeing that a certain high standard is expedient, there is not a body of men in which jealousy towards each other is more manifested, or where ideas, suggestions, and even acts are so severely criticised.

Each man considers himself as impregnable in his methods, and loath to yield a point for fear that one unprotected spot will cause the wreck of the whole. A happy thought or an accidental discovery straightway forms a hobby for the dentist to mount and ride in the face of overwhelming opposition of his brethren, or even the better judgment of himself. There is a long list of them.

Implantation, transplantation, excessive use of crown and bridge work; all gold workers; all plaster workers; the inveterate amalgam worker; he who contours fillings; he who advocates the flat filling; the electric mallet champion; he of the hand mallet, and he again of hand pressure; exponents of burning engines; of hand drills; of chairs; forceps; clamps; nerve barbs; and even to office coats; all have their supporters, and if any of them are lauded and recommended, some one else has something better and far more practical.

When such a state of affairs exist to introduce "a higher standard theory," however delicately it is done, will meet with some opposition.

The first step has been taken, and has been entirely successful, and that is the education of the patient. Books, pamphlets and directions have been placed in their hands, and they have read and gained a thorough knowledge of what is required of them. No excuse can be offered for not understanding the first principles of teeth preservation ; the path is straight and clean cut.

It had been a hard fight but with the masses educated by an intelligent dentistry, the way has been paved for higher advancement.

It now lies with the dentist to improve the opportunities offered, and place the profession at an enviable height, and lift it out of mere business relations.

The best results may be looked for from a systematic training of the dental student. This is of vital importance, and is a feature that receives but little serious thought. Dentistry seems, to some, to be a broad highway to wealth, that can be traveled quickly and without apparent labor, and failing in other means of livelihood, they turn to it. The path of the successful dentist is fraught with downright hard work, both in research and operation. An applicant for matriculation in a dental college must have a good education ; not a smattering, but must be well booked in ordinary branches, in fact; an *intelligent* man.

If his education has been neglected, or he could not afford the time to devote to it, or the excuse is he has not had the opportunity, it is certain that he never will have the time or inclination to perfect himself in our profession ; he will never elevate or ennoble it, but will act as a drag, and hamper those who are working so earnestly and honestly for its welfare.

If more students were plucked than is the rule, the less of rebuilding, patching and correcting of errors by the able practitioner would be the result. It is simply sickening to witness the loss of valuable teeth at the hands of ignorant, unskilled operators. At the root of the evil, some years ago, were some of the examining boards of several states and some dental colleges. They were responsible for the admittance of uneducated, unskillful and unreliable persons. Through the examining boards at that time, it was an easy matter, comparatively, to become a full-fledged dentist ; the fee and a handful of vulcanite plates proved the "open sesame." I maintain that a more rigid examination should be given before a State Examining board than is required in a college ; for the college for the time being, becomes the home of the student, and the faculty has opportunities to learn of the habits of those under its care. If any student is g

to debauchery in any form it is their duty to refuse to countenance that person longer, let alone graduate him and turn him loose into a profession that requires so much delicacy as ours.

A young man who is addicted to the liquor habit should be debarred the privilege of entering a dental school; it is a vice that clouds the brain, corrupts the morals, and prevents the exercising of proper skill and judgment, so necessary in a successful practitioner.

This is a wrong that college faculties must correct, but they are too apt to close their eyes and ears at anything occuring outside of the college walls. The list of matriculents must be swelled, and by that means many persons of execrable habits and grossly ignorant, both in theory and practice, face the world with a degree. Give the young man a chance to reform? Let him sow his wild oats? Gentlemen, we want young men to recruit our ranks who need no reforming; who have no wild oats to sow.

If the foundation is strong the superstructure cannot fail to be reliable.

This reprehensible habit of using intoxicants, to which may be added the excessive use of tobacco, I have seen indulged in by dentists of long standing, before and even during office hours. If refinement is to be attracted to our offices these vices should be eschewed and strongly condemned. There is no profession extant where personal appearance, deportment and surroundings are such important factors in securing patronage.

At one time the college clinic rooms were filled with people of the poorer class, seeking for needed relief and attention at moderate rates. I firmly believe that now, at some of the colleges, that class of people are not wanted. The reason is obvious; those institutions are being fostered more and more in the interest of money getting. They loose sight of the object of their charters in their anxiety to cater to a monied clientage.

I recognize the fact that they must run them in a business way, and be made self-supporting, but if their charters were readily accessible and were carefully scrutinized, their methods would be found to be very far from letter perfect.

They are carried on much in the same manner as the large "trust" combinations are; appropriating specialties; designs and ideas to the detriment of dental ethics, professional standing, and the practice of the dentist at large. In dentistry there is a great temptation for outside work. By that I refer especially to the work done at home, or at boarding places by many students, who, after a few

months of college life, feel themselves competent to engage in practice at their residences; said work being done at remarkably low figures. But just here is the nucleus for "cheap dentistry;" here is a grade established; here is where the idea is conceived that, in dentistry, there is a sliding scale of charges, and that those dentists who do command large fees, are simply extortionists. For example, and this is one of many, a few days ago the writer heard a lady, who could well afford to retain the services of a skillful operator, tell a prominent dentist that she could get the *same kind of work* done in every respect, for five dollars, for which he had asked twenty-five.

The student, for such he was who had made the offer, making it a point, though, that she must visit his home and *not* the college. Did I say the *same kind of work?* Well! if years of experience goes for naught that kind of "cheap basis" logic might hold good, but happily such judgment was warped by the price That cheap dentistry and insufficient dental knowledge does exist is well known, and that some care nothing for a professional status is a matter to be deplored. It can hardly be conjectured that there are dentists practicing who have no dental literature to peruse, or who take no means to ascertain what improvements are being made in the dental world. Yet, such cases have come under the writers knowledge; they never read the journals, or attend dental society meetings and how, in the name of common sense, they manage to exist in such a desert is to be wondered at. How can they avoid making mistakes?

But mistakes in dentistry, now, are criminal. A dentist who destroys a pulp when he ought to know that it can be saved, or who knowing it, has not made the effort, or who extracts a tooth needlessly, on the patient's solicitation, is committing a misdemeanor.

The days when a patient was allowed to suggest or dictate are over. The operator should know the why and wherefore of every case entrusted to him. It is not a question of "Doctor, take that tooth out!" But, "you have placed yourself under my care, and I will save that important organ." No amount of persuasion should cause this rule to be broken; if the tooth can be retained to perform its required work, then it is the patient's sacred duty so to do. The wholesale extraction of teeth as engaged in by some persons, too base to be designated dentists, merely for the profit that there is in the insertion of an artificial denture, should place them under the ban of the law. How quickly the vendors of acid tooth washes and powders were arrested and jailed. Why not make examples of those who so ruthlessly extract, mutilate, or destroy the dental organs, whether through ignorance or for monetary considerations?

It is a privilege of the graduate, and one that he should hasten to embrace, to connect himself with a dental society, not as a connection only, but as a regular attendant and active worker. This is another step forward; the study and investigation after graduation. But here arises a question: "Where is to be found the perfect society?"

How often, in a dental meeting, has the entire evening been consumed in settling objections and parliamentary questions, the result of the love of contention on the part of some members, or of personal vanity to appear as obstructionists of others. The quicker a dental society gets down to the work for which it was organized, the less of friction there will be in its midst, but as men of different characteristics are members, it seems impossible for perfect harmony to exist. I grant that debate is the life of the society, but the constant clashings of the man with the ponderous dental therapeutical knowledge, with little knowledge of practical dentistry with him of the practical dental knowledge and a little knowledge of its therapeutics; and the one who knows it all and is always willing to afflict, who takes great delight in worrying him who knows little, but knows that little thoroughly; then the objector who retards each and every motion, question and act. All such will effectually kill the interest of a meeting and prevent the attendance of acceptable members.

There is a vast power invested in a dental society, and for that reason the brains of the profession should be found in it. No petty jealousies, political methods or personal resentments. These have caused the death of several societies, which should now have been in successful and beneficial operation. With a society on the right track, and in conjunction with others of like calibre, many needed revolutions in the dental world can be accomplished, laws promulgated and carried through various legislatures, a standard raised that would leave no loophole for the entrance of charlatans, and if the grade is not reached by those, who are already within the borders of the profession, it would put an effectual stop to their nefarious work.

In close connection to the dental societies are the conventions to which are sent, as delegates, the representative members of each local society, where new ideas in the shape of treatments, designs, inventions and investigations are discussed and examined.

These conventions should be the "shining stars" to which the dentists can turn for light and wisdom, and out of which the greatest culture and highest professional bearing should emanate.

Alas! into them creep, too soon, discord and dissatisfaction; there are many lamentable examples. Conventions that were once

influential bodies have declined wonderfully in recent years, and many of the best practitioners will not attend meetings simply because of the pernicious habit of electioneering, wire pulling, the gratification of personal selfishness, etc , as an adjunct to bitter animosities. Who will be the "Great Heart" to deliver them out of these "sloughs of despond?" As the years roll on, and hundreds are admitted into the dental ranks, it is well to pause and do some earnest thinking, and with these sober thoughts come one of vast importance: *Why cannot we pick out those who are to follow us?* Separate the good wheat from the chaff? And if, by so doing, we unknowingly discard two, three or four who would have been ornaments and of infinite worth to the profession, but we also prevent the entrance of a dozen who would have by their connection contaminated it, we are still the gainers.

College faculties should awaken to the fact that in their hands is the powerful lever, through their alumni, to maintain the standard, and year after year, raise it higher and higher. It cannot be too earnestly urged upon each dentist to exercise extreme caution in the selection of a student from the ranks of the young men who present themselves desiring to make dentistry their life work for "by their fruits ye shall know them."

REPORT OF THE PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

By Theodore F. Chupein, D. D. S.

INCIDENTS OF OFFICE PRACTICE.

Dr. Chupein called attention to severe pain in the teeth complained by patients wherein no cause could be found. Mr. I. S. W., a patient, (being one of several) complained of severe pain in an upper left molar. The tooth to all appearance was perfect, being of that dense, compact, well-formed kind. A gold filling had been inserted near its mesio-masticating edge, but this was not deep or extensive. The pain was occasioned sometimes on eating salt or sweet food, at other times on taking hot or cold liquids in the mouth. The second bicuspid had been lost, leaving the space of the width of that tooth between it and the first bicuspid. The gum had receded slightly from the neck of the tooth, but only very slightly. The gum was not adherent to the tooth on this surface, so that a scaler could be passed, probably about one-eighth of an inch under its free margin. There was no tartar on this surface, nor was there any decay at any point on the tooth.

Dr. Roop had met similar cases. He had treated them with the nitrate of silver.

Dr. Trueman had likewise treated such cases with nitrate of silver. In the use of this drug, he was reminded how often history repeats itself. The paper of Dr. E. A. Stebbins, published in the October (1891) number of the *International Dental Journal*, bringing to the notice of the profession the efficiency of nitrate of silver in dental practice, has attracted wide-spread interest. It doubtless will, judging from remarks made, call to the attention of many for the first time the usefulness of this remedy, and yet, probably, no remedial agent known to dentistry has been so long or so continuously used. Long before the advent of arsenic it was used to devitalize pulps. It is a very old remedy for sensitiveness at the necks of denuded teeth; in the treatment of putrescent pulps, alveolar abscess, the arrest of superficial decay, the cure of tooth ache, the disease now known as pyorrhea, and in various diseased conditions of the gums. Indeed, one writer more than half a century ago, speaking of its many virtues called it "The dentists' sheet anchor." From the beginning of dental journalism to the present time few remedies, if any, have been so often noticed and with so little adverse criticism.

In the fused form it is at times quite brittle, and should therfore be secured in a quill or silver tube, the end only being exposed. Thus used it is more conveniently handled. In some cases it is better to use it in crystals or in powder, or in solution, being applied by means of a lock of cotton or a pointed stick. The late Professor Buckingham suggested at a meeting of this association many years ago that when he desired to make a delicate application, he used a *pure silver wire*, dipping this into *nitric acid*, and after a few moments touching with the point of the wire the spot to which he wished to make the application.

Dr. Stebbins states, in his paper, that it does not cause discoloration unless the tooth is decayed. This has not been his experience. The natural enamel surface is seldom, if ever, discolored, but the exposed cementum at the neck, or where a tooth has been filed to remove superficial decay, discoloration occurs, not always, but so often that it is best to expect than to flatter oneself that it will not blacken.

Dr. Chupein had had a case very recently where it exhibited very marked effect on an exalted sensibility of the dentine. He asked how many dentists actually exposed the pulp before making the arsenical application? To expose the pulp until blood was observed

to ooze from the point of exposure and to apply the devitalizer at this point and seal it in the cavity was the course recommended, but this procedure often caused such exquisite pain that he usually removed only such decay from the cavity as could be done without inflicting too much pain when he applied the arsenic, and sealed it in the cavity, depending on its being absorbed by the dentine to effect the killing of the pulp. When making such an application his first point was to have the cavity dry, preferably in all cases by means of the dam, secondly to apply the arsenic over the floor of the cavity, as near the point of exposure as possible, to hold this in place either with a wad of *dry cotton*, or a small lead disk, and finally to secure all in place with temporary gutta percha filling, or with adhesive wax. He only used sandarac varnish to seal such applications when he was unable from the nature of the case; to use the other agen.s. He said that Dr. Kirk had recommended as a neat, tidy and effective means of devitalization, to first make the arsenic into a paste with "Robinson's Remedy" and then to work this into cotton fiber, and to twist this into a loose rope, cutting this into small pieces the size of a mustard seed for application into the cavity.

DR. TRUEMAN pursued the same course as Dr. Chupein in making arsenical applications. If to make an exposure gave too much pain he applied the arsenic with as little previous excavating as possible, often simply syringing out the cavity with warm water. He related that Dr. S. L. Mintzer, of Philadelphia, many years ago told him that he seldom devitalized a pulp with arsenic, as he was able to so insert a barbed broach into the pulp canal that by a quick dexterous movement the pulp was instantly severed and removed with little or no pain. Since then he had met a number of Dr. Mintzer's patients upon whom this operation had been performed, and with very few exceptions they confirmed his statements.

DR. ROOP asked what medicine was best used after the application of arsenic?

DR. CHUPEIN thought it was best to use nothing, but to let the case remain for a week or ten days, until a sloughing or partial sloughing of the pulp occured. He had heard, however, that an application of dialazed iron could be used to neutralize the mischievous effect of the arsenic.

DR. JOS. PETTIT relied on his old friend carbolic acid in such cases.

DR. TRUEMAN on creosote, but did not know that it was necessary.

DR. CHUPEIN maintained that either of these agents was not indicated, as they were antiseptics and would have a tendency to preserve

the dead pulp from putrefaction, and the object sought was not to preserve but to get rid of this animal tissue by extraction as soon as possible. After the pulp was removed, it was well enough then to apply an antiseptic, in order to prevent any putrefactive process which might ensue from particles of dead pulp which were not entirely removed.

Dr. Roop had used tannin combined with glycerine after the application of arsenic.

Dr. Trueman spoke of the use which some English dentists had of using arsenic combined with chalk and alcohol as a root filling.

Dr. Jos. Pettit would fear to use such a root filling least it might attack the peridental membrane through the foramen.

Dr. Roop spoke of his great confidence in, and success with, iodoform in cases of putrescent pulp, this agent in his hands proving successful where many others recommended for the same purpose had failed.

Dr. Jos. Pettit had had like experience with iodoform, so that he relied on it.

Dr. Chupein also relied on iodoform in such cases. But wishing to be rid of the odor he had tried aristol. He had not been able to get a good solvent or vehicle for aristol. He had tried alcohol and chloroform, but aristol formed a viscid, gummy, intractable mass with these which precluded its use.

Dr. Roberts found resorcin dissolved in alcohol invaluable in cases of putrescent pulp, and when a tooth would not stay comfortable with other agents had found it would with resorcin. He said that he had foun a valuable agent for sensitive dentine in cocaine made into a paste with glycerine.

Dr. Roop had had excellent results for this with Robinson's remedy.

Dr. Chupein showed the lower impression cup devised by Dr. M. Lukens Long. He had found it very serviceable and recommended it for taking impressions in cases where there were long teeth remaining n different parts of the lower jaw, the extra depth enabling one to reach the gum, where the more shallow lower cups were useless for such cases. Several other members had used it and liked it, and wondered why dental manufacturers did not make them of different sizes, as it was far superior to the lower impression cups with enclosed cavity for the lower front teeth.

Dr. Roop spoke of a sample of red gutta percha which he had presented to several members which was very hard yet was readily

softened over the hot water bath, stating that it wore well even on masticating surfaces.

Dr. Jos. Pettit used gutta percha almost exclusively for root filling. He always moistened the root canal with carbolic acid before introducing the cone, as this acted as a lubricant whereby the gutta percha could be readily carried to the end of the root.

Dr. Roop said there was no lubricant for gutta percha like the oil of cajiput, and he used this for root canal fillings and for cavities that he filled with gutta percha. He said that by its use gutta percha could be packed into and made to adhere to a wet cavity. He proved this by procuring a tumbler of water. A piece of gutta percha of a size necessary to fill an ordinary cavity was slightly moistened with oil of cajiput when it was carefully softened over the blaze of a lamp. When soft it was pressed against the side of the tumbler *beneath the water*, to which it adhered so firmly that it required some force to dislodge it.

ARGENTI NITRAS AS A THERAPEUTIC AGENT IN DENTISTRY.

By E. A. Stebbins, Shelburne Falls, Mass.

(From the International Dental Journal.)

Dr. Stebbins claims that with this agent many cases of superficial, and some deep-seated, decays have been arrested. His mode is to clean away the debris from the cavity and rub powdered nitrate of silver into the decayed cavities by means of a small pointed stick fastened into a handle and bent in such form as to reach nearly all places, as shown by Fig. 1. This is a steel instrument drilled at each end, as shown by the dotted lines, wherein small pieces of wood may be fitted to take up the powdered nitrate of silver.

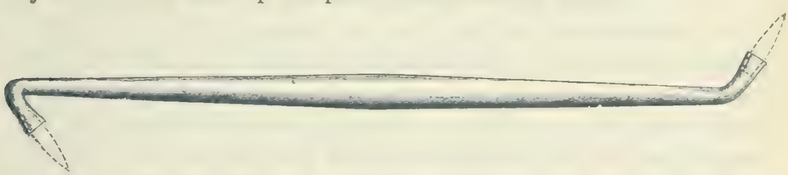

Fig. 1.

Dr. Stebbins gives the manner of application as follows :

" Make of hard wood fine slender points, that will enter very small cavities."

" Put these points into the handle on different angles to reach all portions of the teeth."

" Pulverize the crystals (owing to impurities in the common lunar caustic sticks, it is preferable to use the crystals.)"

"The salts are dissolved in an equal amount of water, therefore there should be but little moisture in the cavity, or on the surface to be treated."

"Moisten the wood-points a very little, so the powder will stick to it, and then take up on it an amount about the size of the head of a common pin, or more, according to the size of the cavity or surface, and apply to every part of the diseased portion. Apply enough salts and moisture to be sure the whole surface is touched. The salts will take effect in a minute or so."

"Waste amalgam scraps rubbed over the treated surface, or cavity, will take up the liberated nitric acid and turn the decay dark instantly. (Since writing this paper I have used silver filings.)"

"I have not sufficient data to determine whether the application of amalgam is beneficial or not, but theoretically I think it is."

"Silver, instead of wood points, may be used."

"Of course, the mouth of the patient should be protected during the operation."

"Any slight touch to the tongue or other parts of the mouth will do no harm. I never heard a complaint of bad after results. Some dislike the taste."

"Use colored napkins so the stain will not show."

"Do not allow the patient to wipe the mouth immediately with a handkerchief for fear of getting it stained."

"After the salts have taken effect, and you are through with the treatment, at once inject a copious amount of water to carry away the surplus; also allow the patient to rinse the mouth well."

EDITORIAL.

We published in our May issue, an article by Dr. M. E. Fletcher, on the "treatment of pulpless teeth," which we gleaned from our exchanges—but which we were unfortunate enough to neglect to record from which of these we derived it—but whichever it was, it was printed as we reproduced it, and we find from the inquiry we have had, as to the proportions of the medicines used in the treatment, that it was best to write to "Headquarters," and find this out.

We therefore present what Dr. Fletcher says in the matter for the benefit of our readers.

"I have continued to use this plan of treating since I first began it, and find nothing in my hands has accomplished the desired results so quickly.

I have for the past year been using alcohol as a menstrum instead of water, first, because it is an additional antiseptic; secondly, because

it dries from the root canals more rapidly than water; with this exception the process of using it is the same as published. The formula is as follows:

Arsenious Acid..............................one part.
Precipitated Chalk ....two parts.

Glycerine sufficient to make *a thick paste.*

Several drops of the alcohol should be used to mix the paste, in order that it may not all evaporate before it can be used."

HOW TO GET A TIN CAST.

GET a good plaster model, dry it, dip in melted stearine, and take two or three impressions in moulding sand. Pour one of them with tin, wait a few moments, and pour the tin in the sand back into the ladle. A thin coating of tin which has cooled gives a perfect hollow cast. If too much time is allowed the hollow cast will be too thick. A little experience will show how long to wait. With a very thin saw make several cuts from the edge to the centre of the ridge. Fill with plaster, and you have a plaster cast coated with tin, and the slits made allow the sections to be bent inward, and the plate will come off. If this last precaution is not taken, you are liable to fracture the plate or check the gum sections in taking off the case. With small partial cases, that come off and on the model easily in the wax, I invest without the model, and finish and fit the case to the model after vulcanizing. Then it goes into its place in the mouth without any filling.

Let me ask some young operator, who swears by a plaster model, to try my way with the next partial plate he has to make. Of course, I do not refer to partial suction cases, as I never make any. Get a perfect impression in modeling compound, making a special tray, if necessary; dry and dip the model; make a wax plate with a strong wire or two imbedded in it; grind in the teeth, at the chair preferably; and see that the wax plate fits the model nicely in every part. Take it off and on two or three times till you feel sure you do not bend it in so doing. Invest without the model, and when it is finished and polished it will fit the model exactly and the mouth as well. If your case ever breaks, or you want to add a tooth, your model is ready. If your patent goes abroad, and breaks the case, you can mend it, and be sure it will fit, if sent by mail, and if some poor old grinder gets loose, and drops out, you can cut the corresponding tooth off the model and add one. It is sure to be right.—*Chas. Rathbun*, *Items.*

BOOK NOTICE.

A Treatise on Dental Jurisprudence for Dentists and Lawyers, embracing the following subjects: Dental Jurisprudence, Dental Expert-Testimony, Identification by means of the Teeth, Dental Malpractice, Cocaine Poisoning, Fracture of the Maxilla during the Extraction of Teeth, Injuries and Death due to Anaesthesia, The Jurisprudence of Dental Patients, etc., etc., by William F. Rehfuss, D. D. S., author of "Dental Massage;" member of the Odontological Society of Pennsylvania; of the New Jersey State Dental Society; Dental Protective Association of the U. S. A., etc. Published by the Wilmington Dental M'f'g. Co., No. 1413 Filbert St., Philadelphia. 1892.

We have received a copy of the above work from the Wilmington Dental M'f'g. Co., and advise every member of the profession to obtain a copy. In these days of recklessness, when every tyro thinks himself a full fledged "Specialist," the advice contained in its pages, showing how the incompetent operator may be easily prosecuted for malpractice by attempting to do that which he has not fully informed himself upon, will doubtlessly prevent many cases, which appeal to the courts for settlement.

Many of the older members of the professson will recall how the body of Dr. Parkman was identified by his artificial teeth, though the murderer had sought to obliterate all traces of his deed by burning the body to a crisp.

This and many interesting subjects are treated of in its pages, which are indexed and paged so as to afford ready references.

We compliment the author on the finishing of a work the subjects of which are seldom touched upon in dental literature, and doing so in a clear, distinct, and eloquent manner.—[Ed.

DENTAL ASSOCIATIONS.

The next meeting of the Northern Ohio Dental Association will be held in Akron, O., the first Tuesday in May, 1893. The newly elected officers are:

President—W. H. Whitslar, Cleveland.

Vice-President—S. B. Dewey, Cleveland.

Cor. Secy.—H. Barnes, Cleveland.

Rec. Secy.—S. P. Bethel, Kent.

Treasurer—Chas. Buffett, Cleveland.

H. Barnes, Cor. Sec'y.
Per. J. T.

THE PRACTICAL PLACE.

A HARD CASE.—Below a labial cavity in a lower cuspid, the gums and alveolar border had receded so that the cavity extended nearly one-eighth of an inch below the margin of the alveolar border on the opposite side of the tooth. This is perplexing to fill with gold. But take a piece of hard wood, shape it like a wood carver's gouge, only let each corner project that it may pass between the teeth, fitting it to the position on the tooth. Before applying the dam, saturate a thin piece of spunk with a 20 per cent. solution of cocaine, and lay it on the gums for five or ten minutes; do not have too much of the solution, lest it mix with the saliva. Now apply the rubber dam; also the ligature, tied loosely for the present. Pull the rubber and ligature downward in front of the tooth, so as to expose the entire cavity and margin of the gums above the rubber. Place the stick in position and hold the rubber below the cavity firmly; let loose the rubber, and with a thin instrument, carefully work the rubber to its place. In this an assistant may be of great service by tightening the ligature gently while holding the stick firmly in place with the left hand. The cavity may now be prepared and filled entirely with the right hand.—*I. Douglass, in Ohio Journal.*

METHOD OF ATTACHING TEETH TO GOLD PLATES BY MEANS OF VULCANITE.

I HAVE lately noticed several methods of attaching porcelain teeth to gold plates by means of vulcanite. The following I have practiced for the past ten years with much satisfaction. It is equally good for full or partial cases, upper or lower plates, and works best where other methods are least satisfactory as when the porcelain is almost or quite in contact with the gold.

Take an old automatic plugger point, shorten it, file "four sided," then bevel from one angle or corner to a sharp point at the opposite corner, harden, and draw the temper to a full yellow. You then have the ordinary "graver" or "engraver's tool" to fit your automatic mallet. The gold plate being "rimmed" and otherwise ready for the rubber, is placed on the plaster cast and the entire surface of the gold which is to be covered by the aforesaid rubber, is stippled or roughened by means of this "graver" in the mallet, with as heavy a blow as is possible to use without indenting the under surface of the gold. By this means hundred of little spurs are thrown up from the surface of the gold at various angles to which the rubber attaches itself with remarkable tenacity. Pink rubber should always be used for this

purpose, the greater contraction during vulcanization of the other varieties defeating the object desired. If this "stippling" process is thoroughly done, no fear need be entertained of the rubber tearing away from the gold.—*J. Hall Lewis, D.D.S., Washington, D. C., in Ohio Journal of Dental Science.*

Perfume for the Breath.—L. D., Philadelphia.—A very fine preparation for perfuming the breath is the Eau de Botot, mentioned in the April number, under the heading of "Liquid Dentifrice," in reply to the query of another correspondent.

A perfume for more convenient use where frequency of employment is required, is the cachou, which usually consists mainly of liquorice extract and essential oils. The following formula will serve as a typical one:

Powdered extract of liquorice	3 ounces.
Refined sugar	1 ounce.
Powdered tragacanth	$\frac{1}{2}$ ounce.
Oil of cloves	1 dram.
Oil of cassia	$\frac{1}{2}$ dram.

Beat together with water enough to form a stiff mass, which make into very small pills or lozenges, as desired. These are usually coated with silver leaf by being rolled in it while still moist.

To Dye Ivory.

Black.—Wash the ivory well in an alkaline solution, then steep in a weak neutral solution of nitrate of silver, drain and expose to the light.

Blue.—Steep in a weak solution of sulphate of indigo, which has been nearly neutralized with salts of tartar, or in a solution of soluble Prussian blue.

Green.—Dissolve verdigris in vinegar, and steep therein for a short time in a glass vessel.

Purple.—Steep in a weak neutral solution of chloride of gold, and expose to the light.

Red.—Immerse in an infusion of cochineal in ammonia, having previously soaked it for a short time in water slightly acidulated with nitric acid.

Yellow.—1st Steep the ivory for some hours in a solution of sugar of lead; then, when dry, put it into a solution of chromate of potassium. 2nd. Dissolve as much orpiment (best) in solution of ammonia as it will take up. Steep the ivory in the solution for some hours, then dry in a warm place.

Minute Wonders of Nature.

Human hair varies in thickness from the 250th to the 600th part of an inch. The fibre of the very coarsest wool is only the 500th part of an inch in diameter, while in some species of the sheep it takes 1500 of their hairs laid side by side to cover an inch on the rule. The silk worm's web is only the 5300th part of an inch in thickness, and some of the spiders spin a web so minute that it would take 60,000 of them to form a rope an inch in diameter! A pound's weight of spider's web of this size would reach around the world and then leave enough to reach from New York to San Francisco. A single grain of musk has been known to perfume a room for twenty years. At the lowest computation that grain of musk must have been divided into 320,000,000,000,000 particles; each of them capable of affecting the olfactory organs, The human skin is perforated by at least 1000 holes in the space of each square inch. For the sake of argument, say there is exactly 1000 of these little drain ditches to each square inch of skin surface. Now estimate the skin surface of the average sized man at sixteen square feet and we find that he has 2,304,000 pores.

To Make Wax Sheets.—After having properly cleaned the wax, get four pieces of glass cut the width you wish to have your sheets, and about ten inches long. Any deep vessel, such as a dinner pail, or an old oyster can will serve to melt the wax. Put the pieces of glass in a pail of cold water, and when the wax is melted, take two pieces of the glass, one in each hand, and dip alternately, one cooling while you dip the other; repeat this three or four times and then drop into the cold water, allowing them to remain till you dip the other two in the same manner. If the edges of the glass are now trimmed with a knife the sheets will drop off themselves. Should the wax be kept too hot the sheets will be too thin, and if too cold they will be lumpy and thick; near the setting or cooling point is the proper temperature. A tablespoonful of Venice turpentine to three or four pounds of wax will toughen it.—*Dom. Dent. Jour.*

Some oxyphosphate is poor; there is no doubt about that. There are also some poor manipulators; there is no doubt of this. A gentleman called my attention to some cement he had been using. It was still soft, though it had been mixed fifteen minutes. "Mix another batch," said I. He mixed it, and that was all right; it became very hard in a few minutes. "Now, what can be the difference?" said he. Then I mixed some that hardened so quickly it crumbled before it

could be used. I mixed some more that would not harden at all, or at least, in time to be of use. The difference in all these was only in the mixing. His first and my last were mixed too thin. His second was mixed in the right proportion, and my first was mixed too stiff, with all the powder brought on to the fluid immediately, instead of gradually.

For pyorrhea alveolaris try a freshly prepared saturated solution of sulphate of copper. To apply, take a hard wood stick the size of a match; cut one end down to the thickness of thick writing paper, roughen the edges, twist on a very little cotton, dip into the solution and pass into the pockets, after pretty well removing the moisture with a napkin or bibulous paper. This works like magic.—*I. Douglass.*

"A temporary purpose which is served by gutta-percha plain, better than when in combination with wax," says Dr. R. Ottolengui, "is where a patient has dangerous cavities, in which a pulp exposure may occur at any time. It is impossible to fill them all at one sitting with permanent materials. It is very wise, however, to cleanse them all of decay, and fill with gutta-percha. Thus all is made safe at once, and the permanent fillings may be placed at leisure."

A smooth glazed bowl is best for mixing plaster. If some of the plaster dries in the bowl, it will come off easily when water is poured in.

Before cutting an old plaster model, drop it in water, and it will soon cut easily. It should also be soaked a little if plaster is to be added to it.

Oil of Wintergreen is said to be good for rheumatism. Take a few drops on loaf-sugar several times during the day.

Devitalizing Paste.

I would like to mention a formula which relieves pain in eight cases out of ten. It is as follows:

Arsenic (in fine powder)................four parts.
Cocaine hydrochlorate..... ....four parts.
Menthol ....one part.

Glycerine (sufficient to make a stiff paste), applied as arsenic is applied.

I may say with this formula two-thirds of my cases are comparatively free from pain.—*Dr. McIntosh, before Illinois Society.*

To separate a model from an impression, when they have been left together for some time, first drop them in hot water. The steam generated will make separation easy.

Obtaining the Bite.

Dr. W. Goodfellow, of Sussex, New Brunswick, writes us that a process which never fails to secure a correct bite in articulating artificial teeth is to direct the patient to open the mouth and then to see that the tongue is placed firmly against the roof of the mouth, *well back*, and held there while closing it. In this position it is impossible to advance the lower jaw.—*Dental Advertiser.*

Freckles.—Some people are born freckled and others have freckles thrust upon them. The former class might as well accept their freckles as a dispensation of Providence, for nothing can be done for them. The latter can always get rid of their affliction by using a couple of drachms of sal ammoniac with an ounce of German cologne, the solution mixed with a pint of distilled water. Applied two or three times a day, states one of our contemporaries, it will cure the worst case of acquired freckles on record.—*Scientific American.*

Sick Headache.—For headache, wet with camphor a piece of flannel (red), sprinkle with black pepper and bind it on the head. There is nothing better than this, it being quick and sure.

Mucilage.—A very clear and transparent mucilage of great tenacity may be made by mixing rice flour with cold water, and letting it gently simmer over the fire.

Remedy for Indigestion.—Half an ounce of ground Turkey rhubarb; one drachm sulphate quinine; one drachm of extract of sarsaparilla. Put the sarsaparilla into a cup of cold water; then add the other ingredients. Make into a stiff paste; it will then be ready to make into pills with the use of a little flour. The whole costs but a small sum and makes nearly one hundred pills. The dose is two pills every other night.

Steel Rust.—Steel which has rusted can be cleaned by brushing with a paste made of half an ounce of cyanide potassium, half an ounce of castile soap, one ounce of whiting, and water sufficient to form a paste. The steel should first be washed with a solution of half

an ounce cyanide potassium in two ounces of water. To preserve steel from rusting, a good method is to paint it with melted caoutchouc, to which some oil has been added.

A Solder for Aluminium.

The soldering of two pieces of aluminium has heretofore been considered impracticable, but recent experiments show that it can be easily done by the use of chloride of silver as a fuse. The pieces of metal are placed together, and a finely-powdered fused silver chloride is spread over the juncture. The solder is then melted by a blow pipe.—*Rural Collaborator.*

Pierre's Eau Dentifrice.—H. H. D., Brooklyn, N. Y.—According to Hager a similar preparation may be made by adding to a tincture of 15 grams of star anise in 200 grams of alcohol, 50 drops of the oils of star anise and of peppermint, the whole being colored with anilin red.

To bore rubber stoppers use a sharp-edged brass tube as thin as possible, and lubricated with soap and water. The hole will be a little smaller than the tube. It may be done by hand, or the tube may be chucked in a lathe. The tube is to be rotated and pressed against the stopper.—*Scientific American.*

Carbolic acid is removed from the hands by bathing them for a sufficient time in alcohol and then anointing with lanolin. After the use of bichloride of mercury solution the hands should be bathed in a solution of common salt one to fifty, then washed with soap and water, and finally rubbed with lanolin.

Favorite Tooth-Wash.

Oil of Peppermint	30 minims.
" Spearmint	15 "
" Cloves	15 "
" Cinnamon	45 "
Tincture of Cudbear	3 grains.
" Myrrh	1 fl. dram.
S. V. R. to	16 oz.

Mix.

Gold Alloys.

Prof. Roberts-Austen has drawn attention to the fact that the properties of gold are changed in a most remarkable manner by

alloying it with small percentages of other metals, and he lately exhibited a new series of alloys of this metal with aluminum. One of these alloys, containing 20 per cent. of aluminum, forms an exception to the usual rule that the melting point of an alloy is lower than that of either of its constituents. This alloy has a fusing point above that of gold, the most infusible of its constituents. Curiously enough, the alloy with 10 per cent. of aluminum follows the ordinary rule. These alloys have the most brilliant colors. The 20 per cent. alloy is a brilliant ruby in tint, while those containing greater percentages of aluminum are purple in hue.

In case of fire somebody asserts that a wet silk handkerchief, tied without folding over the face, is a complete security against suffocation by smoke; it permits free breathing, and at the same time excludes the smoke from the lungs.

A New Tin Alloy Which Clings to Glass and Metals With Great Tenacity.

The American Journal of Photography recommends an alloy of 95 parts of tin and 5 parts of copper for connecting metals with glass for photographic and other purposes. The alloy is prepared by pouring the copper into the molten tin, stirring with a wooden mixer, and afterward remelting. It adheres strongly to clean glass surfaces, and has nearly the same rate of expansion as glass. By adding from one-half to one per cent. of lead or zinc the alloy may be rendered softer or harder, or more or less easily fusible, as required. It may also be used for coating metals, imparting to them a silvery appearance.

Immediate Removal of Dental Pulps.

Take a ten per cent. solution of cocaine, or the following solution I have used with success :

Cocaine crystals ....20 grains.
Antipyrine.................................20 grains.
Carbolic Acid ....10 drops.
Distilled Water ....1 ounce.

Mix. It will keep indefinitely.

Rubber dam applied or napkins in place, fill hypodermic syringe with solution ; place tube in the opening of pulp cavity gently against pulp, then steadily but rapidly force the contents of the syringe against and up into the substance of the pulp. The pain is only momentary, and in three minutes you can enlarge the opening into the pulp cavity. If pulp is still sensitive, repeat the dose. You can

then remove the entire pulp without giving pain. In molars, each root has to be treated separately. The force used in injecting the remedy is an important factor in successfully performing the operation, and it should be directed in such a manner as to penetrate the fang as far as possible. The anæsthetic effect is temporary, and if the pulp is not all removed at first sitting, sensation will return again in an intensified form. As soon as the pulp proper is removed, fill the hypodermic syringe with tincture of hamamelis, Pond's Extract, and force it into the pulp cavity, same as before. This will not only wash out the loose fragments, but it will control the hemorrhage. I never had it to fail to stop the hemorrhage immediately. When I am satisfied the pulp is all removed from the fangs, I syringe same as above, then dry with absorbents first and complete with hot air. Fill roots usually with chloro-percha and gutta-percha cones. If convenient, fill crowns at same sitting. Every case so treated has been a success.—*Dr. J. C. McCoy, Mo. So., Archives.*

Aluminum Soldering.

The following methods of soldering aluminum are recommended by the Neuhausen Company. For sheet aluminum an iron-tin solder may be used with a flux composed of resin, neutral chloride of zinc, and grease. The metal should not be cleaned or scraped unless it is absolutely necessary to do so, in which case alcohol or essence of turpentine should be used for the purpose. For five per cent aluminum bronze tin solder may be employed, but this is not possible with the ten per cent alloy, in which case the company recommends preliminary copper plating. If it is difficult to dip the ends to be plated directly into the solution, pieces of blotting paper soaked in a solution of $CuSO_4$ may be laid on them and a current passed. The flux mentioned above may be used.

Another solder which is recommended is one consisting of copper fifty-six parts, zinc forty-six parts, and tin two parts, applied with borax. Some tests made at Neuhausen showed that with these solders plates of alumin soldered together, edge to edge, required a tractive effort of from sixteen and one-half to eighteen tons per square inch to pull them asunder; if the edges overlapped, twenty-two and one-quarter tons per square inch were required. Pieces of cast aluminum bronze, if placed in sand moulds, can be joined together autogenously by running in some of the molten metal. If this operation is properly carried out, the joint is indistinguishable from the rest of the casting. Thin cylinders of aluminum are made in this way by bending the sheets round end to end, and soldering with molten aluminum.

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[FIFTEENTH PAPER.]

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 139, Vol. VI, No. 5.)

BLEACHING THE TEETH.

This operation consists in the effort to restore a devitalized tooth to its normal color.

When the pulp of a tooth dies, and is permitted to remain within the tooth, the dead pulp exudes putrescent matter of a discoloring nature which infiltrates into the dentinal tubules, from the effect of which the tooth assumes an opaque, brown, greenish, or bluish tinge, very unsightly in comparison with the other teeth not affected with dead pulps.

The first effort is to remove all decay and to enter into the nerve chamber and root canal, and to carefully and scrupulously scrape away every particle of discolored tissue, without disturbing the enamel except to cleanse this. The cavities are frequently washed with tepid water with the dental syringe.

The rubber dam should be applied and "Larbanaque's solution of chlorinate of soda," used freely—being careful not to let it get on the face or lips.

The root canal may be filled 'with first, dry chloride of lime, and this moistened with dilute tartaric acid, when it is quickly sealed and allowed to remain in place for ten or fifteen minutes, when the process may be repeated in the same way two or three times. This treatment may be pursued for two or three consecutive days, until an improvement in the discolored tooth is observed, after which the whole interior of the crown may be filled with the oxychloride of zinc filling and when this hardens to remove so much of it as may be necessary to form a cavity for the insertion of a gold filling.

The bleaching of a tooth is rarely attempted beyond the six upper front teeth.

Oxalic acid, and the cyanide of potassium are also used for their bleaching properties, but on account of their deadly poisonous properties they should be employed with great caution and care.

The success of the operation will very much depend on the time the dead pulp has remained undisturbed within the tooth.

Dr. Harlan recommends the free use of the peroxide of hydrogen, and then to place a few crystals of chloride of alumina in the cavity, which are moistened by the peroxide, permitting this to remain in the tooth for three to five minutes. After this the cavity is well washed with distilled water, when a solution of 30 grains of borax to one ounce of water is used to neutralize the acid. The cavity and the tooth are then well dried, and filled with oxy. cho. of zinc, which when this hardens, a cavity is formed and the tooth filled with gold.

Dr. Ames recommends Electrolysis for bleaching teeth. He says: "First fill the root and moisten the cavity with acidulated water (one drop to the ounce of water, in order to render it a more effective electrolyte), then apply a metal electrode connected with the negative pole of the battery in contact with the moistened surface of the margin of cavity and pass a platinum needle, connected with the positive pole of the battery, over the surface to be bleached. Upon closing the circuit the oxygen of the water is liberated at the positive pole near the surface to be bleached, and the hydrogen is liberated at the negative electrode outside the cavity."

PYORRHŒA ALVEOLARIS.

The word pyorrhœa is derived from two Greek words signifying, the exuding or discharging of pus. Pyorrhœa alveolaris means therefore a flow of pus from the alveolus.

The disease first makes itself felt by an uneasiness, or irritation about the gums, not amounting, at this stage, to pain, but gradually becoming painful. The gums look flabby and inflamed and bleed at the slightest touch. As the disease progresses, the gums become more congested, and have a bluish cast, doubtless from the engorgement of venus blood, while they hang loosely or become separated from the affected teeth. Together with this condition of the gums, the borders of the alveolar processes, melt away, and this condition, resembling a necrosis of the thicker portions of the bone, continues, leaving the teeth with no socket or no support, which makes them so loose that they are ready to drop out. In the meantime there is a purulent discharge of pus, which comes between the gum and the

tooth whenever the gum is pressed, however lightly. The discharge is thick and creamy, of a light yellow color, and imparts a very disagreeable taste to the mouth and so impregnates the breath as to make this very offensive and repulsive. This discharge from the socket does not prevent the deposition and adhering of the salivary calculus, which collects in nodules and grows very hard and is generally of a dark greenish color, to remove which, with the teeth in their excessively loosened condition, is extremely difficult.

The disease is generally brought on from local causes, permitting the salivary calculus to form about the teeth, so that by its gradual encroachments, the gums are forced to recede, and the tartar deposited farther and farther on to the roots of the teeth. The sanguinary deposit, which finds its origin in the serum, now collects, after which the teeth begin to loosen. While this may be its local origin, the disease assumes its worst form when favored by an unfavorable diathesis, so that should the patient be of a good healthy organism, the result would only be in the deposit of tartar about the necks of the teeth, while if the reverse would end in pyorrhœa alveolaris. Any condition of the body affecting the circulation, is a predisposing cause of the disease.

TREATMENT.

The first effect will be the thorough removal of the calcic deposit

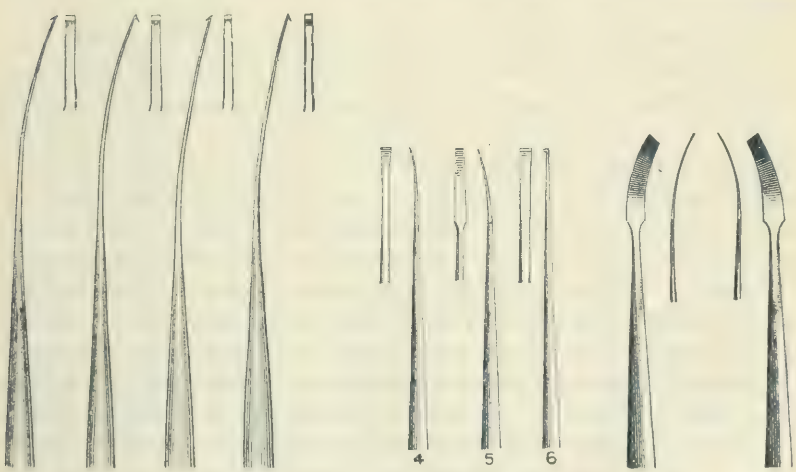

FIG. 216.

and the careful cleansing of the roots. Such instruments as are shown by Fig. 216, will be found serviceable for this purpose as they can

readily be insinuated between the gum and the tooth and with a drawing or pulling motion the tartar is detached or scraped off. When the disease has made farther progress it will be necessary to hold the teeth with the fingers of the left hand, on account of their extreme looseness, while the instruments for the removal of the tartar are used with the right.

It will be found, in such cases, if a splint be constructed of base plate gutta percha, to be quite an aid in the cleansing. To do this cut two strips of the gutta percha, about a quarter inch wide, and the length of the width of the sheet. Soften this in hot water and while holding the loosened teeth from their lingual surfaces with the fingers of the left hand, the strips of gutta percha may be nicely matted against the labial faces of the teeth. The strips should extend from about the firs t or second bicuspid all around. When this strip has hardened, a similar strip may be placed on the lingual surfaces of the teeth and the ends brought over to fold against the strip used on the labial surfaces. These ends are united with the heated blade of a spatula. When it hardens it may be removed from the teeth and so cut and dressed that it will not intercept the view to the surfaces near the gums that are to be worked on.

With such an aid, the tartar may be scraped off with more facility than is possible by holding the teeth with the fingers of the left hand.

If the bone has become affected the margins of the alveolar processes must be scraped off—or this may be removed with a *sharp round cavity bur* in the dental engine. The diseased bone will be easily removed, so that the healthy harder tissue is easily recognized by its increased resistance. It will be necessary to approach this carefully, and a nice sense of touch, both for the removal of the necrosed bone, as well as for the removal of the adherent tartar is a necessity. As this operation causes profuse hemorrhage, the constant washing of the mouth with water, in which phenol sodique is added, or a little permanganate of potash is recommended. It is well also to use either of these washes tepid, and also to change the dental syringe with them and purge out the places operated on, by inserting the nozzle of the syringe between the tooth and gum and forcing in the washes. When all the tartar is removed, as well as the diseased bone each loosened tooth should be wrapped around with a small rope of floss cotton which has been dipped into a dilute solution of aromatic sulphuric acid. This should be permitted to remain on and around the teeth, and packed well down (or up) until it lies in contact

with the bone, that the effect of the drug may be exerted. This may be repeated several times: indeed the operation requires several sittings. The use of a wash of dilute chloride of zinc may be used alternately with the aromatic sulphuric acid, will be found serviceable, when the disease is complicated with constitutional disturbances.

Astringent mouth washes are prescribed to be used frequently in the interim of the appointments. The patient too, may aid in the cure by making a small swab of a sharpened match stick, around which cotton is wound, and using this with a weak solution of aromatic sulphuric acid, or weakened Larbanaque's solution of the chlorinate of soda, painting the gums once or twice a day with tinct. of iodine, and a soft tooth brush used with a weak solution of phenol sodique at night before retiring.

It is not always the case that *hard* tartar will be found on the teeth loosened by pyorrhœa alveolaris. Sometimes the tartar will only have the appearance of a soft, light yellowish deposit. This is more readily removed. When all the deposit is removed it is not a bad plan to use an engine polishing brush in the dental engine such as is shown in Fig. 227. The use of this will cause considerable bleeding of the gums, but by its continued use the hemorrhage will in a measure cease and the teeth nicely cleaned.

In order to see to a certain extent what is to be done, it has been recommended to wrap cotton floss all around one of the loosened teeth, (one at a time). In this way the root is left comparatively bare, and the operator can see any little nodule or adhering piece of tartar.

The pockets formed by the non-adherent gum, may be filled with powdered iodoform and we have used the tartarate of chinoline in these pockets with considerable benefit. After either of these drugs has been used for a few days the gums are so pushed away from the teeth, that the adherent tartar may be readily scraped off and the edges of the alveoli also removed until healthy bone is reached. Unless the operator have a steady hand and a delicate touch, he would do better to remove the necrosed bone with instruments, rather than to attempt this with the dental engine as recommended. In removing the diseased bone around the teeth care should be used so as not to mutilate the gum margins, whereby the new periosteum will have a better chance to form. All the drugs used in the pocket, at a previous sitting, should be thoroughly washed away with tepid water before another treatment is begun, and before this is begun (after the wash-

ing) the pocket should be syringed out with peroxide of hydrogen in which a few drops of the bi-chloride of mercury are added—of a strength of 1 to 1000.

MEDICINES.

The dentist should be provided with all medicines for the treatment of such diseases as are used for the teeth. It is not necessary however that all of these should be kept within reach.

Near the bracket table, and in such easy reach as they may be readily obtained, such medicines as carbolic acid, tincture iodine, tincture aconite, creosote, glycerine, oil cloves, arsenic or nerve-paste, mercury, chloride zinc, tannic acid, acetate morphia, sandarac varnish, cosmoline, muriate cocaine, alcohol, chloroform, peppermint and ammonia.

For the relief of severe toothache, when caused from a nerve exposed, or nearly so, a little powdered acetate of morphia mixed into a paste with either carbolic acid, oil of cloves or creosote, and applied within the cavity and kept in place by a pledget of cotton, is a most infallible remedy.

Carbolic acid, creosote, or oil of cloves, should be used to wipe out all cavities of decay in the teeth previous to filling.

Tincture of iodine and tincture aconite to give relief by painting the gums in cases of acute pulpitis.

Tincture aconite and chloroform to apply on a pledget of cotton down into the socket to give relief for pain after the extraction of a tooth.

Glycerine to be used as a solvent for carbolic acid previous to the addition of water when this is needed as a styptic. When carbolic acid accidentally gets on the lips or face and cauterizes, glycerine applied to the spot neutralizes

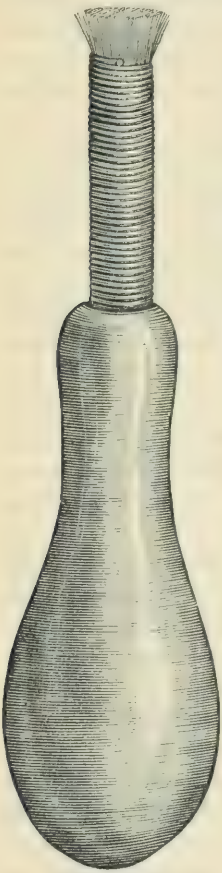

FIG. 217.

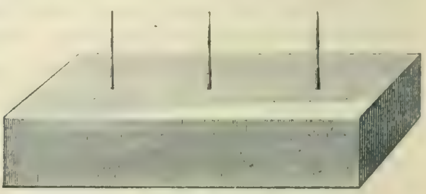

FIG. 218.

the effect and eases the pain produced by the escharotic. It is used also as a solvent for tannic acid, when this is indicated.

Arsenical paste for devitalizing.

Mercury to mix with amalgam.

Chloride of zinc for the relief of sensitive dentine.

Sandarac varnish to use as a temporary stopping on cotton for retaining medicines within a cavity.

Cosmoline to use with iodoform to form it into a paste in the treatment of putrescent pulp.

Muriate of cocaine as a nerve obtundent and local anæsthetic in cases of extraction of the teeth or the pulp. Used in the former with massage.

Alcohol as a detergent for treating teeth.

Chloroform as a detergent and agent in the treatment of root canals, sensitive dentine, relief after extraction, &c., &c.

Peppermint as a counter-irritant to the gums in cases of pulpitis used with massage.

Ammonia. Useful for fainting after extraction, or fainting induced by fright of dental operations. Useful also to dissolve the phosphate of zinc filling material which adheres to the pluggers used with this material.

These medicines being in constant and daily use should be always kept near at hand. Other medicines, which from their disagreeable odor, or on account of the effect which a bright light has on their efficacy, or which may have to be kept in a cool place may be farther removed from the bracket table.

CONVENIENCES.

There are many conveniences, which are intuitively suggested to the operator, in the prosecution of his work, which find their way near his operating table. Thus the small boiler for softening gutta percha preparatory to its use for filling teeth, and illustrated by Fig. 112 of these papers. The file or bur cleaner shown at Fig. 217, which will be most useful to remove the decayed dentine which adheres to the bur used

FIG. 219.

FIG. 220.

in the dental engine. At one time we used spunk altogether as an absorbent, cutting this up into pieces of different sizes to be used in different cases, but we have found Japanese bibulous paper a so much better absorbent that we have abandoned the use of spunk altogether. If pieces of Jap. bib. paper be cut in different sizes—say, some a half inch square, others an inch square, and still others one and a half inch square, and these stuck over a large needle driven into a small piece of walnut board, as shown by Fig. 218, it will be found quite a convenience while working. A solid flint glass paper-weight, two inches square, making a cube of six sides, is one of the best adjuncts for mixing oxy. phosphate or oxy. chloride filling materials. For the latter, a bone spatula—such as is shown by Fig. 219, and which any dentist can make from an old tooth brush handle, is most convenient for mixing the oxy. chloride, which should not be manipulated with a steel spatula. The case knife, such as is shown by Fig. 220. will be found most convenient in its place in the drawer of the bracket table for cutting wedges and such other uses for which a knife is always needed. The pivoting appliance illustrated by Fig. 221, which is merely a piece of solid brass rod, soldered to a smaller brass rod and mounted into a handle, which will be found most convenient in setting pivot teeth when gutta percha is used to retain the crown. The larger part is heated quite hot, and being placed over the porcelain crown, the heat is thus carried to the gutta percha in the root, and helps to make a nice adaptation of the crown. The cotton box is a most convenient adjunct. It is a round box over which very wide wire meshed cloth is stretched. This is pressed from beneath by a flanged spiral spring, which holds the cotton against the meshes of the wire cloth, and keeps it always ready for use. (Fig. 221 A.). In the use of separating rubber, pure rubber should be kept in a jar of water, and a piece sliced off, the necessary thickness, to

Fig. 221.

Fig. 221 A.

place between the teeth in order to gain room to fill. Kept in this way the rubber always retains its elasticity and does not deteriorate, which cannot be said of the partially vulcanized rubber, which is sold in different thicknesses and widths for this purpose. This latter soon deteriorates and is useless. The rubber dam holder, Fig. 222, a

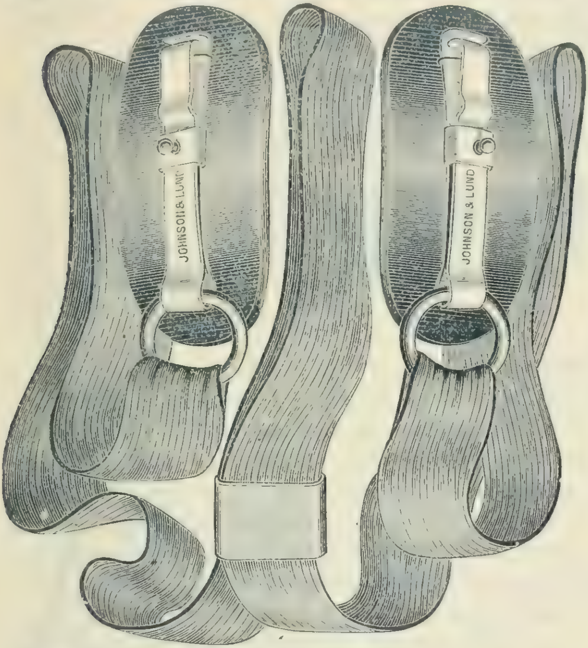

FIG. 222.

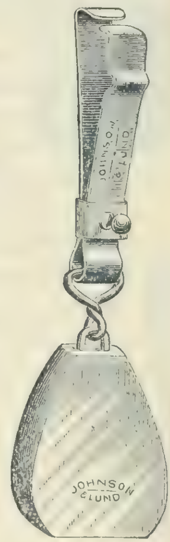

FIG 223.

FIG. 224.

most excellent device for holding the rubber dam smoothly against the cheeks of the patients while operating. The rubber dam weights, Fig. 223, also excellent aids for keeping the rubber dam smooth over the face of the patient while operating. The dam and napkin clamp, a device shown at Fig. 224 for holding a napkin next the face or chin of the patient, to absorb the moisture which creeps from the mouth and renders the feeling anything but agreeable to the patient, without this precaution. The drop tube shown by Fig. 225, which is merely a piece of rubber tubing about $2\frac{1}{2}$ inches long by $\frac{3}{4}$ of an inch in diameter, which is stretched over a nozzle at one end and a butt at the other. In use, by compressing it in the middle, while the nozzle is held in a tumbler of water, the air is expelled, when the pressure is removed the tube becomes filled

with water. This is most convenient to keep disks and corundum points wet, while using them to cut the teeth or to cut down a gold, amalgam or other kind of filling. Dr. Wood's small rubber cups, Fig. 226, used on a Hoey mandrel—a most convenient device for cleansing the teeth and polishing gold or

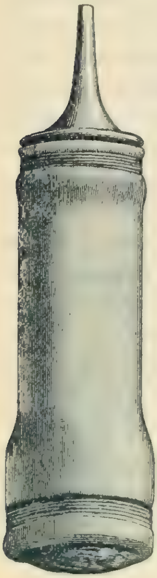

Fig. 225.

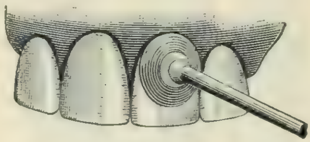

Fig. 226.

amalgam fillings. The dental engine polishing brushes—Fig. 227, a convenient device used in a proper mandrel for cleaning the teeth. The disk setter, Fig. 228—a device by which corundum and shellac disks and points may be set "true" on mandrels used in the dental engine, a very useful appliance. The broach forceps or pliers, Fig. 229—a pair of very long nose pliers or forceps, brought to a

Fig. 227.

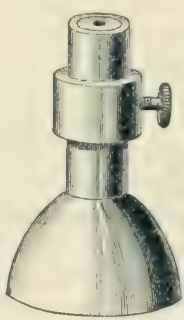

Fig. 228.

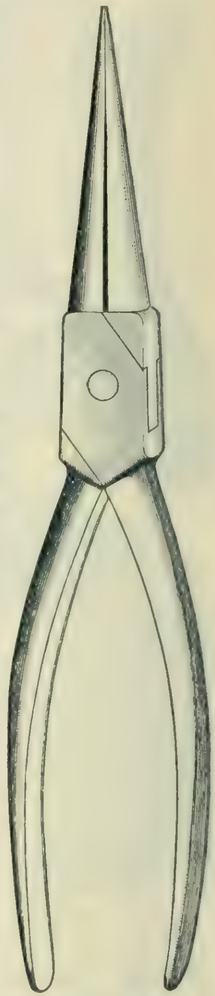

Fig. 229.

very fine point for seizing and removing the end of a broken broach left in the root.

There are many other little devices and conveniences will be suggested to the operator for facilitating work, as he pursues his avocation from year to year.

[TWELFTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D D S , Philadelphia, Pa.

Q. What is the best method of directing second dentition?

A. By possessing a knowledge of the relative positions of the deciduous, as well as of the permanent teeth, in the jaw, at the time, or soon after the eruption of the first tooth of the permanent set.

Q. How is this knowledge acquired?

A. By a study of the anatomy of the jaws and of the erupting teeth at this period of the patient's life.

Q. Should the permanent erupt out of line, out of position, or out of place what is the consequence?

A. Such a misfortune results not alone to the detriment of beauty, expression and appearance, but it militates against health by the lack of the proper occlusion of the malplaced teeth interferring with digestion by the improper trituration of the food.

Q. Besides these consequences what others result?

A. The gums as well as the alveo-dental membranes are more apt to be influenced by the mal-position of the teeth.

Q. What is the cause of the irregularity of the teeth?

A. It is due to several causes; among these to heredity, to the failure of the absorption of the roots of the temporary teeth, whereby their permanent successors are thrown out of position, to "thumb sucking," to the premature extraction of the temporary teeth, whereby the germs of the permanent teeth are injured and delayed in their time of eruption, or by the closing up of the jaw by premature extraction of the temporary teeth, whereby insufficient room is given to their larger successors.

Q. Are the temporary teeth ever irregular?

A. They sometimes are, but not so as a rule.

Q. Which teeth of the temporary set are observed to be irregular?

A. Generally the upper lateral incisors.

Q. What form of irregularity of the permanent teeth is the most difficult to combat?

A. That produced by "thumb sucking."

Q What is the duty of the dentist in this relation?

A. To caution, urge and advise parents to break up this pernicious habit in their children.

Q Is it more difficult to force an *out growing* tooth *in*, or an *ingrowing* tooth *out*?

A. The latter is less difficult.

Q. Why?

A. Because the alveolar plate is thinner towards the lips than towards the palate or tongue, and consequently offers less resistence to such appliances as are used to move the tooth into position.

Q. What are these portions of the jaw termed?

A. The lines of Weakness and Strength. The line of Weakness being towards the lips and cheeks; the line of Strength towards the palate and tongue.

Q. Is it best to correct irregularity when it is first noticed or to wait other developments?

A. There is divided opinion on this matter; some contending it is best to correct any malposition as soon as possible, others that as the roots of the teeth are not fully ossified, the pulps of such teeth are more likely to be injured by any intermeddling; or that if young mal-placed teeth are out of line and are gotten into position, the pressure of erupting teeth are apt to throw them back into the position they occupied before the case was corrected, thereby undoing what had been done.

Q. What may be done to prevent irregularity?

A. The timely extraction of the temporary tooth when it is time for the subject to loose it.

Q. How is this determined?

A. By the age of the patient, the looseness of the temporary tooth, or the swelling of the gum, indicating the near presence of the permanent tooth.

Q. Which of these indications should urge the dentist to prompt action?

A. When the coming tooth shows its near approach by the swelling of the gum, while the temporary tooth remains fixed and firm in its socket, thereby indicating that it has not absorbed, to give place to its permanent successor.

Q. Besides the question of the relief from pain, why should the temporary teeth be filled?

A. So as to afford this absorption of the roots of the temporary teeth, whereby the permanent teeth may take their proper position in the arch.

Q. Do not the roots of the temporary teeth absorb under all circumstances.

A. They do not. If a temporary tooth is permitted to decay to such an extent as to result in the death of the nerve, and consequent alveolar abscess supervenes, the roots of such teeth do not absorb, and are frequently a cause of irregularity.

Q. Should a temporary tooth become decayed in this condition, is it better to extract the tooth or to endeavor to cure the abscess?

A. The former is thought the best practice.

Q. If the upper incisors are noticed to be just passing through the gums behind the temporary teeth, what should be done?

A. The temporary teeth should be immediately extracted.

Q. Why?

A. Because if they are permitted to grow in this position they will eventually become locked behind the lower incisors, giving the child not only an abominable expression of countenance but ultimately forcing on her a most disagreeable appliance to wear for the correction of this style of irregularity.

Q. If the second teeth are observed to be very wide or large, should *two* temporary teeth be removed to make room for *one* permanent?

A. Ordinarily no. Yet it must be remembered that at this time of life, the temporary laterals are considerably loosened by the partial absorption of their roots, and these teeth yield or give place to the incoming permanent centrals, which thus find sufficient space in the arch; but when this does not happen it is admissible to extract the laterals rather than the centrals should have a faulty position.

Q. Does the same rule apply to the permanent laterals and temporary cuspids?

A. Yes, with certain reservations. The case should be well considered before these teeth are extracted, however.

Q. Should the rule be followed for the bicuspids?

A. Not necessarily, for as the temporary molars are ordinarily so much larger than the permanent bicuspids, sufficient room is generally found in the arch for the accommodation of these teeth.

Q. What time is regarded the best for correcting irregularity?

A. After the eruption of the eye-teeth—from the Twelfth to the Sixteenth year.

Q. What is said by good authority about the removal or retention of the temporary teeth?

A. Mr. Fox says, "At this time an opportunity presents itself for effecting this desirable object, but everything depends upon a correct knowledge of the time *when* a tooth requires to be extracted, and also of the particular tooth, for often more injury is occasioned by the removal of a tooth too early than if it be left a little too long; because a new tooth, which has too much room long before the room is required, will sometimes take a direction more difficult to alter than a slight irregularity occasioned by an obstruction of short duration."

Q. Would you recommend the extraction of one or more of the permanent teeth to relieve an excessively crowded condition of these teeth?

A. Such an operation is recommended if the pressure occasioned by this crowded condition cannot be relieved in any other way.

Q. Is it ever admissible to relieve this condition by the use of the file or the corrundum discs on the dental engine?

A. Never.

Q. Is the service of the dentist always called for in the direction of second dention?

A. No. Nature is fully competent to regulate all her operations in cases of good health, normal and vigorous constitutions; art is only called in to assist nature, when the subject is delicate, puny, weak and imperfect in constitution and health.

Q. Why is it important to prevent the irregularity of the teeth?

A. Because the teeth are more prone to decay or disease if they are irregular than if regular.

Q. Why?

A. Because certain surfaces of the teeth are made to approximate in the irregular condition, which Nature never intended should approximate, because the general health suffers by the mal-occlusion of antagonizing teeth which prevents the proper comminution of the food, thereby throwing work on the digestive organs which should have been performed by the teeth. Because it is a mar to beauty and often the cause of the most revolting expression and appearance.

Q. Which are the first teeth to erupt of the second set?

A. The first molars of the lower jaw; and these are succeeded by those of the upper jaw. The teeth of the lower jaw being generally in advance of those of the upper.

Q. What name is most frequently given to these teeth?

A. The Sixth Year Molars.

Q. Why?

A. Because they generally erupt about the sixth year of the child's life.

Q. Where are they found in the mouth?

A. One on each side behind the second temporary molars.

Q. Are there any peculiarities about these teeth?

A. The crowns of these teeth are generally larger than any teeth of their class, and they are more liable to decay than any teeth of the permanent set.

Q. What means have been suggested to prevent the pernicious habit of thumb sucking?

A. The painting of the thumbs at night with some bitter substance such as aloes, the tying of the arms close to the body at night to prevent the child putting the thumb into the mouth, or the covering of the hands with gloves, of a course heavy texture, for the same purpose.

Q. Does this habit of thumb-sucking alter the shape of the jaw?

A. It is thought by some to do so, but Dr. Kingsley is of the opinion that the V-shaped arch is always of congenital origin.

Q. What do you mean by "Congenital origin?"

A. It means that it existed at birth, and was not produced by any after circumstances or habit.

Q. Is the irregularity of the teeth or the shape of the jaw due to any other cause or causes?

A. It is believed that the inflammation of the throat, in the early life of children of a stenmous diathesis, may produce both a deformity of the jaws as well as irregularity of the teeth,

Q. How is this accounted for?

A. Because this inflammation causes a hardness and stretching of the muscles which has the effect of contracting the oro-naso-pharyngeal space by pressure on the walls and thereby decreasing the space necessary. Irregularity of the teeth is also produced by the marriage of persons of different nationalities.

Q. How do you account for this?

A. Supposing the *woman* in such a marriage have a *small arched* jaw and *small teeth*, and the *man* should have a *large arched* jaw and *large teeth*, and the child of such a union would partake of the small arch of its mother and the large teeth of its father, it naturally follows in such a case that the small arch would not have sufficient room to accommodate the large teeth, and hence they would be thrown out of their regular positions.

Q. You spoke of children of steumous diathesis—what do you mean by that?

A. Diathesis means "Disposition," "Constitution," "Predisposition to disease," and steumous means scrofulous. Hence "A steumous diathesis" means a person with a constitution disposed to scrofula.

Q. Do you know any other cause of irregularity of the teeth?

A. Yes. Sometimes the retention in the jaw of the permanent teeth will cause irregularity, as in cases where bicuspids and molars may not erupt sufficiently to occlude with their fellows of the opposing jaw.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The eleventh annual meeting of the National Association of Dental Examiners was held at Niagara Falls, commencing Monday, August 1, 1892.

The sessions were presided over by the vice-president, Dr. Magill, the elected president, Dr. L. D. Shepard, of Boston, explaining his resignation from the State Board of Massachusetts, which necessarily carried with it his resignation of the presidency of the association. The resignation was accepted with regret, and Dr. Shepard was unanimously accorded the privileges of the floor.

The following State boards were represented at the session:

Colorado.—George J. Hartung.

Georgia.—D. D. Atkinson.

Iowa.—J. T. Abbott, J. B. Monfort.

Indiana.—S. T. Kirk.

Maryland—T. S. Waters.

Minnesota.—L. W. Lyon.

Massachusetts.—E. V. McLeod.

New Jersey.—Fred A. Levy.

Ohio.—Grant Mollyneaux, Grant Mitchell.

Pennsylvania.—W. E. Magill, Louis Jack, J. A. Libbey.

Tennessee.—J. Y. Crawford.

Wisconsin.—Edgar Palmer.

Kansas.—A. H. Thompson.

The following boards were admitted to membership:

Virginia.—J. Hall Moore.

North Carolina.—V. E. Turner.

Oklahoma.—D. A. Peoples.

South Dakota.—C. W. Sturtevant.

District of Columbia.—Williams Donnally.

At the instance of the committee on colleges, the following communication was sent to the National Association of Dental faculties:

NIAGARA FALLS, Aug. 1, 1892.

To the National Association of Dental Faculties:

GENTLEMEN,—Whereas, a very considerable abuse has arisen by the improper use by students of the various certificates of the schools, such as the "standing" and "passing" certificates to support students and graduates under age in their attempt to illegally engage in practice: we therefore ask your association to request the various colleges to have their "standing" and "passing" certificates of such uniformity of terms in each case that they can be used for no other

purpose, and that they be printed in few words and small type, and be signed only by the dean.

Respectfully,

NATIONAL ASSOCIATION OF DENTAL EXAMINERS,

FRED. A. LEVY, *Secretary.*

A committee of conference was appointed, consisting of Drs. Truman, Marshall, and Swain, on the part of the Faculties Association, and Donnally, Palmer, and Monfort, on the part of the Examiners' Association, which after consultation agreed upon a favorable report.

Dr. Lyon offered the resignation of the Minnesota board, which was laid upon the table, as it had evidently been offered as the result of a misunderstanding, and the board was requested to withdraw it. The following resolution, offered by Dr. Crawford, was adopted:

Resolved, That when a member of any State board becomes a teacher of a dental school, his resignation from his board should follow.

A resolution protesting against the classification of dentists as manufacturers and the collection of census statistics from them under the provisions of House Bill No. 7696, commonly known as the Willcox bill, was adopted. The resolution was similar in terms to those adopted by other dental societies.

The committee on colleges reported that they had received reports showing that the actual number of students in attendance at the last sessions in the schools recognized by the Examiners Association was 2881; of graduates, 1357. In the schools not recognized by the association the students were 236; graduates, 96.

The report also considered desirable advances to be made in educational methods, and offered the following memorial, which the secretary was directed to transmit to the National Association of Dental Faculties:

The National Association of Dental Examiners would respectfully memorialize the National Association of Dental Faculties to authorize two advances in the system of dental education.

These are: First, that your association require the universal enforcement of a higher grade of preliminary education of candidates for matriculation. The proposition lies at the foundation of dental education, in which is involved the quality of the graduates of the future, upon which depend the advancement, the standing, and the dignity of the dental profession.

The second proposition is that complete preparation be made in each school for laboratory technique in the studies of histology, pathology, and in each of the departments of dental surgery and dental

prosthesis, and that this method of teaching be made a requirement of the schools.

The committee also reported the following amended list of colleges which they recommended as reputable:

Baltimore College of Dental Surgery, Baltimore, Md.

Boston Dental College, Boston Mass.

Chicago College of Dental Surgery, Chicago, Ill.

College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.

Dental Department, Columbian University, Washington, D. C.

Dental Department, National University, Washington, D. C.

Northwestern University Dental School. Formerly Dental Department of Northwestern University (University Dental College).

Dental Department of Southern Medical College, Atlanta, Ga.

Dental Department of University of Tennessee, Nashville, Tenn.

Harvard University, Dental Department, Cambridge, Mass.

Indiana Dental College, Indianapolis, Ind.

Kansas City Dental College, Kansas City, Mo.

Louisville College of Dentistry, Louisville, Ky.

Missouri Dental College, St. Louis, Mo.

New York College of Dentistry, New York City.

Northwestern College of Dental Surgery, Chicago, Ill.

Ohio College of Dental Surgery, Cincinnatti, O.

Pennsylvania College of Dental Surgery, Cincinnati, O.

Philadelphia Dental College, Philadelphia, Pa.

School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

University of California, Dental Department, San Francisco, Cal.

University of Iowa, Dental Department, Iowa City, Ia.

University of Maryland. Dental Department, Baltimore, Md.

University of Michigan, Dental Department, Ann Arbor, Mich,

University of Pennsylvania, Dental Department, Philadelphia, Pa.

Vanderbilt University, Dental Department, Nashville, Tenn.

Western Dental College, Kansas City. Mo.

Minnesota Hospital College, Dental Department, Minneapolis, Minn. (defunct).

St. Paul Medical College, Dental Department, St. Paul, Minn. (defunct).

American College of Dental Surgery, Chicago, Ill.

The report was adopted.

The following officers were elected for the ensuing year; W. E.

Magill, Erie, Pa., president; J. Y. Crawford, Nashville, Tenn., vice-president; Fred. A. Levy, Orange, N. J., secretary and treasurer.
Adjourned.

BOOK NOTICES.

567.—USEFUL HINTS FOR THE BUSY DENTIST. By Wm. H. Steele, D. D. S. Published by the Wilmington Dental Mfg. Co., No. 1413 Filbert street, Philadelphia, Pa., 1892.

Works of the above kind are always acceptable to the busy dentist. Dr. Catching in his yearly compend has noticed the fruit of this, and Dr. Steel has added another volume of like usefulness to the Dentists' Library. It is the "grains of gold" by which fortunes are accumulated, rather than the "large nuggets," and when a ready reference is afforded by short pithy hints or articles, these do more good and add more to our stock of knowledge than the larger and detailed articles, which many busy dentists have not time to read.

"When you have a thing to say,
Say it! don't take half a day.
When your tale has little in it,
Crowd the whole thing in a minute!" —ED.

THE PRACTICAL PLACE.

BAD MISPRINTS

Misprints and typographical errors make the editor's life a burden about Fourth of July times. An editor meant to compliment a young lady at a party by noting that "her dainty feet were encased in shoes that might have been taken for fairy boots." When it appeared in the paper the printer made him say, "her dirty feet were encased in shoes that might have been taken for ferry boats."

A YOUNG LADY, having an unfaithful lover, wished to bring him back to her side and published some verses which prophesied her early dissolution. One of the lines ran thus:

"Come gaze upon my dust, false one." But the compositor spelt "dust" with a "b."

The lover came to see her the next evening.

PRACTICAL USE OF A SMALL ELECTRICAL POWER.

To the Editor of the Scientific American:

I have a battery (primary) charging two cells of storage battery, which has been in daily use for nearly a year without once failing. From the storage cells I run a motor, one-eight horse power, giving

me power enough for *all* dental operations, viz., my dental engine used in the mouth and the lathe for grinding and polishing, the electric mallet and mouth lamp. The power is fully equal to the demand at all times. As you well know, the secondary battery needs no attention whatever, and all that I have ever done to the primary battery is to pour out the water once in two months, and put in about four pounds of blue vitriol to each jar. There are ten jars of primary coupled to give five volts and about one ampere ; as a matter of fact, it will give more than one ampere during the two months, but after that period the quantity lessens. The cost of maintaining this is about 75 cents per month, and it requires about one hour to renew, if all the cells are cleansed at the same time, which is not necessary. The capacity of the storage cells is 4 volts and 35 amper hours. This summer, before I went on my vacation, I discharged the secondary battery, and in so doing ran the motor without load for six hours continuously before it stopped. J. E. Stanton.

Boston, Mass., October 14, 1891.

[The above account of Dr. Stanton's experience contains information of value to a large number of our readers who are interested in the practical use of electricity in a small way. We would be pleased to hear from others having similar experience.—Ed.]

Soldering Aluminum.

The inventors claim that surfaces of aluminum may be successfully soldered to each other, and to other metallic surfaces, by using silver chloride as a flux in conjunction with ordinary solder.

The pieces of metal, one or both of which are aluminum, are placed in the relative position required in the joint, finely powdered fused silver chloride spread along the line of junction, and solder melted on with a blowpipe or other device. The joints are thus easily and rapidly obtained, and become hard and perfectly sound on setting, and neither crack, flake, nor check.—*F. J. Page and H. A. Anderson, Waterbury, Conn.*

Tooth Extraction by the Fingers.

A correspondent of the *Archives of Denistry* referring to the unpleasant impression made on dental patients by the sight of forceps, recommends instruction in the art of extraction as practiced in Japan. " There," says the writer, " the dentists extracts every tooth, be it upper or lower, incisor or molar, without the use of an instrument, his fingers having been trained to take the part of forceps. It may

seem incredulous, but it is nevertheless a fact, that the Japanese dentist is more proficient in this particular branch of our art than his European or American brethren, and here is the way he arrives at his proficiency: In a board of soft wood, holes are drilled. and in the holes pegs are inserted loosely. The board is laid on the floor and the apprentice tries to pull out every peg perpendicular without in the least disturbing the position of the board, using the thumb and forefinger of his right hand; able to do this, the pegs are inserted tighter, the thumb and fore-finger gaining strength and dexterity in manipulation as he keeps on practicing. Having perfected himself at the pine board, an oak board is substituted, the oak pegs being driven in tightly. There he practices for weeks and months, till finally the oak pegs succumb to the skill and power of his fingers. The third and last term comprises the extracting of maple pegs very tightly fastened into a maple block. Passing the required examination at this block, he is graduated and sent forth to try and pull 'human pegs.' There we see him take a position similar to one we would assume, hold the jaw and keep the mouth open with his left hand, whilst with the two fingers of his right, he passes into the mouth and extracts, if necessary, five to seven teeth in a minute."

A Foreign Body Removed by the "Potato Treatment."

Dr. J. Solis Cohen reports, in the Philadelphia *Medical News*, that a patient was brought to him several hours after having swallowed an irregularly shaped dental clasp. Exploration of the œsophagus showed that tube to be unobstructed. The patient was ordered to be fed exclusively on buttered mashed and roasted potatoes, and to examine his stools carefully for the foreign body. Within forty-eight hours it was voided, thoroughly coated with potato.

Taking an Impression.

The necessary condition to be obtained in the adaptation of the denture to the tissues, is to have it embrace the alveolar ridge and extend backward on the palate to an extent that the entire periphery will impinge on and slightly displace lax soft tissue. This can only be definitely accomplished by securing an accurate impression of the surfaces of these lax soft tissues which calls for an impression of more of the surface of the mouth than it is ordinarily considered necessary to obtain.

It is important that the impression material should pass upward between the alveolar ridge and the lip and cheeks to the greatest

extent possible, without putting the lip and cheeks on more than a slight tension. It must be carried accurately to the extreme height of the space at the outer side of the tuberosity, when such a space exists, and it should extend on the tissue posterior to the tuberosity for a short distance, and on the soft palate for a sufficient distance, to allow of locating on the model the line of attachment of the soft palate to the posterior margin of the hard palate.—*W. B. Ames, Review.*

The Sun Cholera Mixture.

More than 20 years ago, when it was found that prevention of cholera was easier than cure, a prescription, drawn up by eminent doctors, was published in the *Sun*, and it took the name of the *Sun* cholera medicine.

Our contemporary never lent its name to a better article. We have seen it in constant use for nearly two-score years, and found it to be the best remedy for looseness of the bowels ever yet devised.

No one who has this by him, and takes it in time, will ever have cholera.

We commend it to all our friends. Even when no cholera is anticipated, it is an excellent remedy for ordinary summer complaints, colic, diarrhœa, dysentery, &c.

Take equal parts of tincture of cayenne pepper, tincture of opium, tincture of rhubarb, essence of peppermint and spirits of camphor. Mix well. Dose, 15 to 30 drops in a little cold water, according to age and violence of symptoms, repeated every 15 to 20 minutes until relief is obtained.—*New York Journal of Commerce.*

Treatment of Tuberculosis by Aristol.

At a recent meeting of the Therapeutical Society of Paris, Dr. Vogt presented the report of the committee appointed by the society to investigate the method of treatment of tuberculosis by aristol, devised by Dr. Nadaud, of Mentone. The report was favorable to the method. In twenty-three cases of tuberculosis, a cure was effected in seven cases. In these cases the treatment had lasted from twenty-five to thirty days, and the patients were still well although three or four months had elapsed since the treatment was discontinued. In five cases there had been rapid improvement under treatment, but relapse during the month which followed its cessation, requiring a renewal of the treatment, after which they had remained well, a third series of treatments never having been called for. In three cases in

which there were large cavities, two had died, one of diphtheria, and the other of tubercular peritonitis. Those of the patients still under treatment were materially improved. By the use of aristol the cough is controlled, expectorations lessened, the night sweats disappear, the appetite returns, the weight is increased, and the general conditions of the body are improved. A one-per-cent solution of the remedy in oil of sweet almonds is the form in which it is used, the solution being injected by means of the hypodermic syringe. It is claimed there is but little local pain, and never inflammation, induration, or abcess at the point of injection. In advanced cases the solution is modified by the addition of five per cent. of purified creosote. *Bacteriological World.*

Phenol Camphor.

Phenol Camphor is prepared by dissolving three parts of camphor in one-part of carbolic acid. This produces a rather thin, clear, yellowish liquid, with a strongly camphoraceous taste and smell which mixes readily with fatty alcoholic and etherial liquids, and easily dissolves cocaine, salicylic acid, iodoform and other bodies. Phenol camphor prevents suppuration; it combines the cooling effects of camphor with the antiseptic properties of carbolic acid, and unlike the latter is painless in its action, and does not show acid properties. It is a preparation which commends itself in dentistry on account of its powerful germicidal and deoderizing properties.—*Chicago Medico Bulletin.*

To preserve your instruments from rusting, immerse them in a solution of carbonate of potash for a few minutes and they will not rust for years not even when exposed to a damp atmosphere.—*Ib.*

Alloy for Plates.

Any of the alloy of tin in use may be used for construction of this plate. While I have tried them all I like 15 parts silver to 85 of tin, although the addition of 3 per cent. of bismuth makes a good plate. —*Dr. W. D. Staples*, *Ohio Journal.*

A New Tin Alloy which Clings to Glass and Metals with Great Tenacity.

An alloy of 95 parts of tin and 5 parts of copper will connect metals with glass. The alloy is prepared by pouring the copper into the molten tin, stirring with a wooden mixer, and afterward remelting.

It adheres strongly to clean glass surfaces, and has nearly the same rate of expansion as glass. By adding from half to one per cent. of lead or zinc the alloy may be rendered softer or harder, with variable fusibility. It may also be used for coating metals, imparting to them a silvery appearance.—*Phar. Record.*

We cannot separate ourselves from our work. Our patients will make their estimates of us and couple us with our work. To be well in repute, we must not only be skilful, but personally acceptable—even association with evil scores against us. Like the smoking parson, the drunken lawyer, and the licentious merchant, the dentist of bad character or bad habits will be shunned. He must have clean hands and a clean name to work for clean people.—*Items of Interest.*

How to Drink Milk.

Some complain, says a contemporary, that they cannot drink milk without being "distressed by it." The most common reason why milk is not well borne is due to the fact that people drink it too quickly. If a glass of it is swallowed hastily, it enters the stomach and then forms in one solid, curdled mass, difficult of digestion. If, on the other hand, the same quantity is sipped, and three minutes at least are occupied in drinking it, then on reaching the stomach it is so divided that when coagulated, as it must be by the gastric juice, while digestion is going on, instead of being in one hard, condensed mass upon the outside of which only the digestive fluids can act, it is more in the form of a sponge, and in and out of the entire bulk the gastric juice can play freely and perform its functions.

How to Procure an Impression of the Mouth when Patient is Inclined to Nausea and Vomiting.

Get your druggist to make you some lozenges with one-quarter grain of cocaine in each lozenge. Before taking impression allow patient to dissolve one of these lozenges in mouth and swallow the spittle. If one is not sufficient, give patient another lozenge, allowing time for the lozenge to dissolve slowly, and you will find you can take an impression with plaster of paris without any inconvenience to patient or yourself.—*C. V. Snelgrove, L. D. S. Toronto.*

Plaster of Paris Formula.

1. *To Make Plaster of Paris Set Hard.*—Mix best plaster of Paris with about 10 per cent. (more or less, according to effect ascertained

by preliminary experiment) of very finely powdered marble (calcium carbonate). Or add to it about 6 per cent. of powdered alum, or about the same amount of ammonium chloride, before mixing with water.

2. *To Make Plaster Set Slower.*—Mix it with 2 to 4 per cent. of powdered althæa root before adding the water. This not only retards the hardening of the plaster, but also enables it to be cut, filed, sawed and turned.

An addition of 8 per cent. of althæa powder retards the complete setting of the plaster for about one hour, so that the mass can be used for any purpose where it is to remain plastic during at least a portion of that time.—*Amer. Drug.*

LOCAL ANESTHETIC FOR EXTRACTION OF TEETH OR PULPS.

℞ Cocaine Hydrochlorate........ ....grs. v.
Acid carbolic xtals.............. ....grs. iv.
Gum Camphor opt.................... ......grs. vi.
Glycerine pure..............................grs. xv.
95 per cent. spts vini Rect. Q. S. ad.....drs. ii.

Hypodermic syringe. Inject one or two drops deeply into the gums on inner and outer side of the tooth, and apply over the gums around the tooth, also in cavity of tooth, a piece of absorbent lint or cotton wet in the solution. Wait four or five minutes (by the watch) and the gums can be freely incised and tooth extracted with but little pain.—*Exchange.*

Dr. Hugenschmidt (*La Semaine Medicale*) says that the characteristic symptoms of acute pulpitis are intense neuralgic pain in the region supplied by the fifth nerve, the point of the maximum intensity being at the root of the affected tooth, which is the seat of the disease. The proper treatment is to wash the cavity carefully by means of a stream of warm water injected from a small syringe, using also, if necessary, a stilette with a little cotton wrapped about the end of it. After the cavity has been thoroughly emptied, cotton should be placed in the cavity, after having been saturated with either the following solutions: Menthol, 18 grs., chloroform, 30 grs.; or, hydrochlorate of cocaine and hydrochlorate of morphine, each 4 grs., and creosote sufficient to make a paste of the consistency of cream.

THE pulp of a tooth may be devitalized and removed painlessly in thirty minutes, in the following way: Place the rubber dam on the tooth; then expose pulp, or as near as possible. Take a small piece

of cotton saturated in pure carbolic acid ; place this well up in the cavity ; and leave it for eight or ten minutes ; remove, and with a sharp, round bur, cut into the pulp ; again use carbolic acid for some length of time and then bur pulp all out. Use the acid again, and with a pulp canal cleaner the pulp can be removed painlessly. I have removed a number when two or three arsenic treatments failed. I would not advise to fill the root immediately ; better use glycerin dressing for a week.—*Dr. Jones, Springfield, Mo.*

Sensitive Dentine.

Dr. Williams obtunds sensitive dentine by allowing a simple solu tion of chloride of lime to remain a short time in the cavity. For the general obtunding of sensitive dentine he has the patient rinse the mouth with dilute lime water, not strong enouth to be caustic. He claims to have used these before ether was thought of for that purpose, and says he has obtained good results from them.

Tincture of Iodine mixed with glycerin is claimed by Dr. Hammond to prove more effective as a local application than the plain tincture. This is due to the retardation of the dissipation of the iodine, or, more likely, to the skin remaining soft, and, therefore, in a better condition for absorbing the drug.

Antipyrine in solution applied to the cavity after extracting a tooth, is good to arrest the hemorrhage, and much more pleasant than perchloride of iron. I sometimes use chloroform in the same way, which answers a double purpose.

In filling a cavity in the anterior part of a lower molar that is well down under the gum, the bicuspid missing, it is sometimes difficult to keep the rubber down even when a clamp is used. Take a thin piece of metal, German silver or Taggart tin, fit it neatly between the teeth. When the rubber is adjusted, press this firmly down ; it will carry the rubber below the edge of the cavity and hold it there.
—*Dr. Beacock, Dom. Jour.*

How to Extinguish Fire.

Take twenty pounds of common salt and ten pounds of sal ammoniac (muriate of ammonia, to be had of any druggist), and dissolve in seven gallons of water. When dissolved it can be bottled, and kept in each room in the house to be used in an emergency. In

case of a fire occuring one or two bottles should be immediately thrown with force into the burning place so as to break them and the fire will certainly be extinguished. This is an exceedingly simple process and certainly worth a trial.—*Annals of Hygiene.*

In closing flasks, either by simple pressure or by boiling, use rubber dam wet with soap water instead of muslin, and you will be delighted with the result.—*Items of Interest.*

We are told that cases of neuralgia have occured in consequence of hypersensitiveness of the teeth, caused by a recession of the gums. By using a little nitrate of silver on the exposed parts of the teeth, the sensitiveness and the neuralgia will be immediately relieved.

Flatulent Dyspepsia is often greatly relieved by a mixture of equal parts of powdered sulphur, magnesia, phosphate of lime and charcoal. A teaspoonful should be taken in a glass of water.

Pine Apple Juice.—Recent experiments have shown that three ounces of this juice will dissolve ten to fifteen grains of dried albumen in four hours. These facts are likely to give to the pineapple a prominent place in dietetics.

Lukewarm Baths to Restore the Waning Power of Age to Youthful Vigor.

I have for a long time (being now past 67) suffered from muscular rheumatism, being feverish from weakness of the muscles. I had for a long time known that old people actually dry up so that the tissues become inactive. I also have known that to use a very stiff scrubbing brush vigorously would toughen the parts and clean the skin ready for absorption through the pores of moisture, so that, by lying in a tepid bath, with water at from 88° to 92° Fahreheit, for from a half to one hour, the body would actually absorb by weight from two to three pounds of water. Benjamin Franklin, at about 60, began to feel greatly the encroachments of old age, so he went to Dr. Darwin for advice. The Doctor recommended to him the lukewarm bath, to be taken twice a week. Franklin followed this advice, and very soon noted the beneficial effects of these warm baths upon his aged body. He is said to have continued their use up to within a short time of his death, which was at 84, and to the very last was strong and vigorous in body and mind. It restores elasticity and smoothness to

the skin; it loosens the tissues and thereby brings back fullness and soundness of limbs. It prevents eruptions of the skin, and presently it removes them often even from the face. It prevents the body giving off too much heat, which enhances nutrition.
—*James E. Emerson, Bever Falls, Pa.*

KALODONT.

C. W. H., Jersey City, N. J., kindly informs us that the dentifrice known in Germany by this name is made by dissolving neutral soap in glycerin and rubbing with a suitable tooth powder, the proportions being adjusted to produce a soft mass. Carmine is used as a coloring and the flavor may be given by adding sufficient of a mixture of

	Parts.
Oil of peppermint	25
Oil of lemon	6
Oil of orris root	1
Oil of sage	1

The preparation is usually put up in collapsible tubes.

ALUMINUM WIRE is said to be useful for many purposes in the dental office, such as strengthening rubber plates, making canal points, or as a carrier for conveying iodine, aromatic acid, or any corrosive agent, excepting muriatic acid, it being soft, pliable and clean.

CITROLEINE DENTIFRICE.

Precipitated chalk	1 lb.
Powdered sugar	2 oz.
" orris	4 "
Cuttle fish bone	2 oz.
Bicarbonate of soda	2 "
Oil of lemon	2 drs.

First tint the precipitated chalk with a concentrated tincture of saffron and then spread on paper to dry. Then take the soft portion of the fish-bone, which can be scraped off with a knife, place in a mortar with the sugar, rub well down to a fine powder. To this gradually add the powdered orris-root, bicarbonate of soda, and oil of lemon. Mix thoroughly, then gradually incorporate with the chalk by working in a mortar or mixer or sifter.

CLICKING OF ARTIFICIAL TEETH—CAUSE AND REMEDY.

Clicking and rattling of full sets of artificial teeth, is caused by poor articulation, by ill-fitting plates and by the teeth being too long.

In nearly all full sets, when first tried in mouth, the molars and bicuspids are found to be too long, and to bring the incisors near enough, the cusps are ground, making them flat and smooth with no indentations, thus allowing them to slide about. To prevent this, preserve the cups or points unground, thus allowing them to interlock, and therefore less liable to "clatter." Another great benefit of this method is, that uneven surfaces coming together cut or divide food better.—*A. A. Hazeltine, New Bedford, Mass.*

To Improve Copper Amalgam.

Dr. Bodecker: About three years ago, Dr. Herbst, of Bremen, wrote me a letter about using amalgam, saying that he had very wonderful results if he added to it, before putting it into the tooth, a little fine silver foil. I tried that, and it worked as described,—namely, that the edges will stand beautifully, and there will almost be no wasting. At that time I made some experiments in glass tubes, and filling them with carmine, but I never saw any of the fluid between the tube and the amalgam. I tried the same experiment with copper amalgam, and I was surprised at the success. The discoloration of the copper amalgam which we usually observe is almost entirely gone, and it gets very much harder and wears better. It is done in the following way: When the amalgam is heated very carefully and put into the mortar, a little mercury is added, and the amalgam crushed and rubbed thoroughly; then to about eight grains of copper amalgam I add one leaf of the ordinary fine silver foil which you obtain from any gold-beater. Then I put it into the tooth with the Herbst burnishers, and I must say I have not seen a failure around the edges, or much discoloration. Without the addition of silver to the copper amalgam I have seen more or less discoloration and wasting of the edges.

Dr. Rich: May I ask Dr. Bodecker the weight of the silver-foil he used?

Dr. Bodecker: I have no scales sufficiently delicate to weigh it. It is the fine silver leaf the gold-beaters make, which is used for silvering. It is not a quarter of a grain in weight. It dissolves instantly in the mercury.—*International.*

A Good Filling for Deciduous Teeth.

In filling deciduous teeth it is often almost if not quite impossible to exclude moisture from the cavity sufficiently to permit filling with zinc phosphate, unless the rubber dam is used. The difficulty may be

overcome in the following manner:—Place some of the powder on a glass slab, also a little of the fluid, and beside these a little of chloro-stopping. Make a rather thin mix of the zinc phosphate, then add to this the chloro-stopping, mixing in more of the powder until a thin putty-like consis.ency is obtained; now napkin the mouth, and dry as well as possible (I prefer cottonoid napkins for this), immediately packing to place, and finishing with burnishers. When it has been found impossible to exclude moisture, the filling has been placed in under water, an on removal some time afterwards was found adhering to the walls of the cavity. Some of these fillings have stood for nearly a year, and are still good, showing very little wear.—*S. Eldred Gilbert; D.D.S., in The Dental Cosmos.*

Essence of Cinnamon.

M. Chamberland, one of Pasteur's colleagues, says that no living disease germ can resist for more than a few hours the antiseptic power of essence of cinnamon. He looks upon it as not less effective in destroying microbes than corrosive sublimate. Even its scent kills them, and it does no harm to human beings.—*Discovery.*

Acute Pain After Extraction.

The pain that occasionally occurs so acutely after the extraction of a tooth, appears to be a centralizing of nerve force in the cavity, possibly from the extension of the nerve sheath before giving way. This pain I have found, during twenty-five years' practice, to be *instantly* cured (the nerve force momentarily diverted and never returning to the cavity) by a strong sniff of strong solution of ammonia. This may be worth noting, and is much more easy and rapid than carbolic syringing.—*Cor. Willson, of Grimsby.*

To Clarify wax, melt in hot water bath; then remove from water bath and bring to a slow boil on the stove. Into the boiling wax break a fresh egg, and stir three or four minutes till the egg is thoroughly cooked. Strain through a piece of cheese cloth, to remove all pieces of egg, and you will have your wax as clean and pure as when brought from the dental depot.—*J. E. Harvey, Freeport, Me.*

Dr. W. F. Arnold indulges in some plain talk in the *Odontographic Journal*. He says: "The brutal and unprofessional practice of some dentists of extracting roots by cutting through gum and process with their forceps, to grasp a decayed root, has no excuse, and yet it is a

common thing to do when the patient is under the effect of gas. Not unfrequently the fifth nerve has been severed, and facial paralysis induced by too deep a dip of the forceps in the extraction of the wisdom tooth. Cutting through gum and process to extract a root below the free margin of the gum is mal-practice, and a person so disposed can recover damages for improper laceration of the mouth."

It was Beaconsfield, I think, who said: "The great secret of success in life is to be ready when your opportunity comes."

To separate a model from impression, when left together for some time, drop into hot water; the steam generated makes separation easy.—*Items.*

Syringe Pistons.

Syringe Pistons sometimes get dry and will not work. Instead of soaking in water, smear the dry leather with olive or other oil and spread it a trifle, allowing a minute or two for it to penetrate.—*The Ohio Journal of Dental Science.*

The *Dental Review* says: "Make a saturated solution of zinc sulphate in water and use it with the powder in oxychloride packages and see how hard it will become. Use it as a foundation for filling, or in pulpless tooth crowns."

Botot's Water, or Tooth Wash.

Cloves, in coarse powder	30	parts.
Ceylon Cinnamon, in coarse powder	30	"
Anise, in coarse powder	30	"
Cochineal, in coarse powder	20	"
Alcohol	2,000	"
Oil of Peppermint	15	"

Macerate the solids with the alcohol during one week, frequently shaking. Filter, and in the filterate dissolve the oil of peppermint.

A New Alloy.—What is claimed to be a most valuable alloy has recently been brought to notice, the constituents of the same being copper and antimony, in the proportion of 100 to 6. The process of production consists in melting the copper and subsequently adding the antimony, and, when both of these are melted and intimately mixed, fluxing the mass in the crucible with an addition of wood ashes, magnesium and carbonate of lime, which has the important

effect of removing porosity and increasing the density of the metal when cast. The alloy can be rolled, forged and soldered in the same manner as gold, which it very closely resembles when polished, the gold color being unchanged even after long exposure to ammonia and acid vapors in the atmosphere. The cost of this alloy in the ingot is said to be about 25 cents per pound.

THE *Scientific American* gives the following estimates of the duration of the life of various animals: Elephants, 100 years and upward; rhinoceros, 20; camel, 100; lion, 25 to 70; tigers, leopards, jaguars and hyenas (in confinement), about 25; beaver, 50; deer, 20; wolf, 20; fox, 14 to 16; lamas, 15; chamois, 25; monkeys and baboons, 16 to 18; hare, 8; squirrel, 7; rabbit, 7; swine, 25; stag, under 50; horse, 30; ass, 30; sheep, under 10; cow, 20; ox, 30; swans, parrots and ravens, 200; eagle, 100; geese, 80; hens and pigeons, 10 to 16; hawks, 30 to 40; crane, 24; blackbird, 10 to 12; peacock, 20; pelican, 40 to 50; thrush, 8 to 10; wren, 2 to 3; nightingale, 15; blackcap, 15; linnet, 14 to 23; goldfinch, 20 to 24; redbreast, 10 to 12; skylark, 10 to 30; titlark, 5 to 6; chaffinch, 20 to 24; starling, 10 to 12; carp, 70 to 150; pike, 30 to 40; salmon, 16; codfish, 14 to 17; eel, 10; crocodile, 100; tortoise, 100 to 200; whale, estimated, 1000; queen bees live 4 years; drones, 4 months; worker bees, 6 months.

AN ANTISEPTIC DRESSING.

I have used with great satisfaction, and recommended to others, equal parts of oil of cinnamon, oil of cloves, carbolic acid, and iodine. In this combination iodoform will readily dissolve, so of this last material I add quantity sufficient to make a mass of thick creamy consistency, which is very smooth and easily applied to pockets, cavities, and canals, where a disinfectant is indicated.

The above formula I have used for years with satisfactory results in "pyorrhœa alveolaris" and other local inflammatory conditions. In this combination the odour of the iodoform is reduced to a minimum condition, so that my patients will tolerate it without a word of complaint.

I hear a dozen of your readers exclaim at once: "Why this mixture when you have at hand one equally good in *aristol* and oil of cinnamon?" This is a very pertinent inquiry, and one which I am now solving by daily use of the latter in place of the former, and with results most encouraging.—*Dr. C. N. Peirce, in The Ohio Journal of Dental Science.*

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Dental Office and Laboratory.

FOURTH SERIES.

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[SIXTEENTH PAPER.]

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 170, Vol. VI, No. 6.)

STATISTICS.

We propose to lay before our readers a plan whereby accurate statistics may be kept of one's practice with little trouble to the operator. For the purpose we procure a blank book 10 inches long by 8 inches wide. We rule this off as shown by Fig. 130. As each operation is completed it is taken from the case book (a sample of which was published in the Sept. 1892 number) and recorded as they occur and placed in the different columns. One being for the *Operation*, one for the *Time* consumed, and the other for the *Price* received or charged. The fractions in the *Time* column indicating the $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$ parts of an hour. The fraction in the *Price* column, indicating the $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$ part of a dollar. At the end of each month, by going over the names of those for whom operations were performed, we may arrive at how many males, females or minors we worked for, the same being taken from the case book, and at the end of the year we make a grand total of all operations, and the number of persons for whom we have operated. We arrive too at how many patients have been treated and the subdivisions of the system may be extended into the greatest minutæ, if such data be desired.

MEDICINES.

In the treatment of the diseases of the teeth and gums, certain medicines are used. We do not propose in the consideration of this subject to refer to the whole dental Materia Medica, but only to such as are used almost daily. It is important for the student when he makes use of a drug, not only to know its source, but to know its action and effect, and not to use it because doctor so-and so told him

AUGUST, 1892. (Fig. 130.)

OPERATIONS	TIME	PRICE
Amalgam Fillings, 1 2 2 1 3 1 5 2 2 1 3 2 1 1 2	1 1 ¾ ¼ 1 ¼ 1½ ¾ ½ ¼ 1½ ½ ¼ ¼ ¾	3 3 2 1 3 1 6 2 2 1 5 2 1 1 3
Cleaning Teeth, 1 1 1 1 1 1 1	¼ ¼ 1 ½ ¼ ½ ¾	1 1 3 2 1 2 3
Teeth on Vulcanite, 14 14 10 12	12 12 12 12	20 25 15 20
Phos. Zinc. Fillings 1	¾	2
Gold Fillings, small, 1 1 1	¾ ½ ½	2½ 2½ 3
Gold Fillings, Contour, 1 1 1 2 1 1 1	1¼ 1¾ 2 2 1¼ 1 1¼	5 6 6 7 4 4 5
Gold Fillings, Ordinary, 1 2 3 2 1 1 2 3 2	½ 1 1½ 1 ¾ ¾ 1¼ 1¾ 1½	3 6 8 4 3 3 5 8 7
Gutta Percha Fillings, 3 2 4 3 1 3 4 2 1 4 3 2 1 4 3 4	½ ½ ¾ ¾ ½ ¾ 1 ½ ¼ 1 ½ ½ ½ 1¼ ¾ 1	3 2 4 3 1½ 3 4 2 1 4 3 2 1 4 3 4
Root Treatment, 1 1 1 1	1 1¼ 1 1½	1 1½ 1 2
Root Fillings, 1 1 1 1 1 1 1 1	¼ ½ ½ ½ ½ ¾ ½ ½	1 1 1 1 1 2 1 1
Combination G. P. and Cement Fillings, 1 1	½ 1¼	2 3
Combination G. P. and Amal. Fillings 1	½	1½
Gold Fillings, large, 1 1 1	1 ¾ 1	4 3 3
Combination Tin and Gold Fillings, 1 1 1 1 1	1 1½ 1 1¼ 1¼	5 6 3 4 4
Application Morphia, 1 1	¼ ¼	½ ½
Application Arsenic, 1 1 1 1 1	¼ ¼ ¼ ¼ ¼	½ ½ ½ ½ ½
Nerve Destroyed and Removed, 1	½	1
Repairing Vulc. Work, 1 1 1	4 4 5	2 3 3
Repairing Metal Work, 1 1 1 1	4 4 4 4	3 3 3 3
Gold and Porcelain Crowns, 1 1 1 1 1 1 1	4 5 4 5 4 5 4	8 10 10 10 8 10 8
Puncturing Abcess for Relief, 1	¼	½
Teeth Extracted, 1 1 1 1 1 1 1	¼ ¼ ¼ ¼ ¼ ¼ ¼	1 1 1 1 1 1 1
Teeth on Gold Plate, 8 4 3 4	15 13 15 15	28 25 25 25
Resetting Pivot,	½	2
Teeth on Vulc. Gold Attachments, 8 6 7	12 12 12	10 9 8
Examinations, 1 1 1	1 ½ ½	2 1 1
Teeth on Silver Plate, 3 4 6 9	12 12 12 12	10 12 15 18 $603.50

Adults: Female, - - 36 Adults: Males, - - 10

Minors: Female, 8 Minors: Males, - - 2

it was good in certain cases. Let him, as the Poet Longfellow says:

> "In the world's broad field of battle,
> In the bivouac of Life,
> Be not *like dumb, driven cattle!*
> *Be a hero* in the strife!"

Different medicines have different qualities and actions. Some are *cathartics*, some *tonics*, *caustics*, *refrigerants*, *styptics*, *astringents*, *narcotics*, *&c.*, *&c.*, *&c.*

Thus if you have extracted a tooth and there is a disposition to considerable bleeding you should use a *styptic* medicine. Why? Because a styptic medicine has the effect of arresting the bleeding. If you have a case of *Pulpitis*, which is a congested condition of the pulp, you should use a *stimulant medicine*. Why? (Always use why, and know the reason.) Because stimulant medicines excite functional action, draw the blood away from the part which is overcharged with it and thus restores the equilibrium, and thereby gives relief and sometimes cure.

Therefore, in the use of different medicines, it is important for the student to know all about them. We heard lately a very good remark which should be thought over well by every specialist. It was this:

"One should know something of everything, but everything of something." which means that a man, especially a professional or specialist, should be generally conversant with almost every subject, but on one particular subject he should be thoroughly posted.

The medicines used for their effect by dentists are:

Anæsthetics.	Narcotics.
Antiseptics.	Refrigerants.
Antiphlogistics.	Stimulants.
Astringents.	Sedatives.
Caustics.	Styptics.
Disinfectants.	Tonics.
Escharotics.	Laxatives.

These medicines are used either *Generally* or *Topically*.

It is to be understood that when a medicine is used *Generally* it affects the whole system, as for instance a Laxative or Refrigerant which is taken into the stomach and passes through the system by the intestines, thereby acting on the whole system; but a *Topical* medicine is one that only affects a certain area of tissue, a certain circumscribed part, as for instance the application of carbolic acid to a cavity of decay either to relieve pain by its escharotic and sedative

properties, or to benumb the pain of sensitive dentine from its obtundent or anæsthetic properties. The Topical application of medicines is the one which is most often resorted to by dentists, yet a General application is sometimes used, as in the case of peridental inflammation when a Laxative or Refrigerant medicine is indicated, or when from inability to sleep from severe pain a Narcotic is used.

An *Anæsthetic* is a medicine used to produce insensibility to pain. They are divided into Local and General Anæsthetics.

The most important *general anæsthetics* are *Hydrate of Chloral*, *Tetæchloride of Carbon*, *Chloroform*, *Ether*, *Ethylene Chloride*, *Nitrous Oxide*, *Methylene Dichloride*. The most important *local anæsthetics* are: *Muriate of Cocaine*, *Rhigolene*, *Chloride of Ethyl*, *Ether* used in the form of Richardson's spray.

An *Antiseptic* is a medicine which arrests or prevents putrefaction or preserves tissue from putrefaction. The most important of these are *Iodoform*, *Carbolic Acid*, *Iodol*, *Bi-Chlo of Mercury*, *Thymol*, *Salicylic Acid*, *Boric Acid*, *Eucalyptol*, &c.

An *Antiphlogistic* is a medicine which prevents, arrests or opposes inflammation. Some of these are the *Tinct. of Aconite*, *Iodoform*, *Tinct. Iodine*, &c.

An *Astringent* is a medicine that produces a contraction of the tissues and used for the arrest of hæmorrhage or excessive mucous discharges. They are of two kinds—*Vegetable* and *Mineral* astringents. The principals of the vegetable astringents are *Tannic Acid*, *Gallic Acid*, *Nutgall*, *Matico*, *Rino*, *Catechu*, *White Oak Bark*, *Creosote*, &c. Of the mineral astringents are preparations of *Iron*, *Lead*, *Alum*, *Sulphuric and Nitric Acids*, &c.

A *Caustic* is a medicine which produces a disorganization of the animal tissues by destroying their texture by burning them up. The action of a caustic is to destroy the vitality of the part to which it is applied, when a new action is set up in the underlying vessels, so as to cause a sloughing of the part. The object is to induce the flow of pus from the part by means of a seton or other irritant whereby the diseased parts may be drained. Caustics are known as *Actual* and *Potential*. An actual caustic is fire—or an iron heated to white heat and applied to the part; the Potential are *caustic potash*, *nitrate of silver*, *burnt alum*, *chloride of zinc*, *chromic acid*, *arsenic*, &c.

The use of a caustic is indicated in case of ulceration of the part, where this has become chronic, and in cases of superflous growth.

A Disinfectant is an agent or medicine used to neutralize the odor emanating from disorganized matter. These medicines chemically

combine with them and thus deprive the infected tissue of their odor producing agencies. Some of these are *Chlorine*, *Carbolate of Lime*, *Chloride of Lime*, *Carbolic Acid*, *Salycilic Acid*, *Chloride of Zinc*, *Hydro chloric*, *Sulphuric* and *Nitric Acids*. *Charcoal Creosote*, &c., &c.

An Escharotic is a medicine very much as a Caustic ; indeed their action is very similar. The action of an escharotic is to produce an eschar or slough by burning and devitalizing the tissue deep. Their potency is controlled by lessening their strength by dilution.

Some among these are *Arsenic*, *Chloride of Zinc*, *Caustic Potash*, *Nitrate* of *Silver*, *Bichromate of Potassium*, *Sulphate of Copper*, &c.

A Laxative is a mild purgative and is related to a purgative or a cathartic. Its action may be only to evacuate the bowels (as in constipation) by exciting a discharge of mucous of the intestines, producing a relaxation or loosening, as the word signifies. These medicines, which are numerous, are divided into several classes, according to their action. Among these may be classed *Manna*, *Sulphur*, *Magnesia*, *Seidlitz Powder*, &c. They may be simple or they may be compounded or combined in order to produce different results. Among these are *Saline Purgatives*, *Tonic Astringents*, *Hydragogue Purgatives*, &c. The former is often recommended to divert the congested blood from a tooth affected with pulpitis or with an inflamed peridental membrane to relieve the congestion by diverting the flow of blood.

A Narcotic is a medicine whose action stupifies the energy of the nervous system and produces sleep. They are employed by the dentist for the relief of pain in cases of alveolar abscess. In this form they take the name of *Anodynes*, and when given for the purpose of inducing sleep they take the name of *Hypnotics* or *Soporifics*. Of these, a few are *Chloral*, *Stramoniun*, *Lobelia*, *Dover's Powders*, &c.

A Refrigerant is a medicine used to reduce the temperature of the body and of the blood, or of allaying excessive thirst. It is a cooling medicine which is sometimes termed a *Febrifuge*. Of these a few are *Citric Acid*, *Tartaric Acid*, *Chlorate of Potassa*, &c. It is indicated when there is a disposition towards fever induced by the irritation coming from an alveolar abscess in process of formation.

A Stimulant, as the name implies, is a medicine to goad or excite a sluggish part with action. Of these medicines there are many, such as *Cardiac Stimulants*, *Cerebral Stimulants*, *Cutaneous Stimulants*, &c. They are used generally or topically. In dental practice they are used topically, being applied to the gums or mucous membrane

of the mouth, to produce counter-irritation or vesication. Administered internally to aid digestion they are termed *Stomachics*, and if to relieve flatulence they are called *Carminatives*. When used, as used by the dentist, they take the name also of *Irritants*. Of these, a few are *Capsicum Cinnamon*, *Cloves*, *Ginger*, *Peppermint*, &c.

A Sedative is a medicine used to abate the heart's action or of lessening or controlling the circulation. They reduce the vascular excitement and relieve the irritation caused by the abnormal action of the heart. Among these are *Digitalis*, *White Hellebore*, *Nitrate of Potassium*, &c.

A Styptic is a medicine that has the power of squeezing or constricting the animal tissues so as to lessen the flow of blood or arresting hemorrhage. They are also termed *Astringents*. Styptics are either Chemical or Mechanical in their action. A chemical styptic coagulates the blood coming from a wounded, incised, or lacerated part, exerting its nature to contract the tissues and thus to reduce the flow of blood. Of these, *Tannic Acid, Per-Sulphate of Iron*, *Alum*, *Nut-galls powdered*, *Gallic Acid*, &c., are a few. A *Mechanical Styptic* detains the blood, and absorbs it as it flows from the lacerated blood vessels, and in this way decreases the flow. Of these are *Spider's Web*, *Lint*, *Plaster of Paris*, &c.

A Tonic is a medicine used to strengthen or give tone to the system without producing abnormal excitement. They stimulate by increasing the quality of the circulation, acting also on the secretory and digestive functions. Tonics are *Mineral* and *Vegetable* Of the former are preparations of *Iron*, *Copper*, *Zinc*, *Bismuth*, &c Of the Vegetable are *Gentian*, *Quassia*, *Cinchona*, *Quinine*, *Wild Cherry*, &c.

We have alluded to the principal action and effects of medicines that are used by the dentist. It is well that the student impress these actions and effects on his mind, so as to make a proper selection at the time they are needed.

We propose now to take up a list of such medicines as are most commonly used, and to treat of their origin and composition.

[TO BE CONTINUED.]

[THIRTEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

Q. Do we find the teeth always occupying the place they should in the jaw?

A. No. We find sometimes a lateral incisor occupying the place

where the central should be. The cuspid where the lateral incisor or first bicuspid should be, and the second lower bicuspid sometimes being widely separated from the first bicuspid and occupying the place of the first molar—should this tooth have been lost.

Q. To what is this supposed due?

A. To the transposition of the germs.

Q. What is the word used for the treatment of irregularity of the teeth?

A. Orthodontia.

Q. Should the services of the dentist always be sought to correct dental irregularity?

A. No. Some cases will remedy themselves if the cause which produced it is removed. It is only when the teeth persist in their abnormal position that the dentist should interfere.

Q. What is the general rule in reference to the treatment of irregularity?

A. To correct the irregularity as soon as it is seen that it will not correct itself. Yet as we said before, the age of the tooth will have considerable effect in determining whether it may not be premature to interfere.

Q. Can the position of teeth be changed?

A. They can, by pressure properly applied.

Q. If brought into position will they remain so?

A. Not always. They incline to return to their faulty position when the appliances used to bring them into line are removed.

Q. What is then to be done?

A. A retaining plate is made to hold the teeth in their new relations until new bone forms in the sockets around the roots, to hold them permanently in their altered positions.

Q. In moving irregular teeth should the pressure be intermittent or continuous?

A. There is divided opinion on this point, some contending for one and some for the other.

Q. When the arch of one or other jaws is so small as to prevent the proper occlusion of the teeth, what is done?

A. The arch may be spread or increased in size.

Q. Is this not a dangerous operation?

A. It would be if carried to excess; for it has been known that the two plates of the upper jaw which are united at the median line by a suture have started under the pressure of the appliance used to increase the size of the jaw.

Q. How was this known?

A. By the ready yielding, under slight pressure of the appliance, as also by the visible separation between the mesial edges of the central incisors.

Q. What should be done at such a juncture?

A. All pressure should be immediately discontinued and a retaining plate made to hold the two halves of the bone *immovably* until new bone forms to fill the space which has been gained by pressure.

Q. What is the best way to regulate the teeth?

A. The simplest way is the best. To let Nature operate instead of the Dentist.

Q. Can you give me a case in point?

A. Should the cuspid erupt on the outside the arch, between the lateral incisor and the first bicuspid, and it is seen that there is insufficient room for the cuspid to take its place, it would be preferable to extract the bicuspid and let the cuspid fall, of its own accord, in its position in the arch, than to seek to gain room by spreading the arch.

Q. Do not many cases of corrected irregularity ultimately fail?

A. Yes.

Q. To what is this often due?

A. To a lack of persistence on the part, either, of the dentist or patient.

Q. Which teeth may be extracted for the correction of an irregularity?

A. The bicuspids or the first molar. Sometimes an upper lateral incisor may be removed to correct irregularity rather than subject the patient to the tedious operation of moving the bicuspid and cuspid backward in order to prevent the loss of one of the front teeth. A central or a lateral incisor of the lower jaw is often removed to correct an irregularity of these teeth, or to relieve a crowded condition. As a general thing however the extraction of any of the six oral teeth for the correction of irregularity, is only done after the most mature deliberation.

Q. What is the first thing that should claim our attention in seeking to correct an irregularity?

A. The removal of the cause. Whenever the presence of any of the temporary teeth is giving a false direction to the permanent ones they shonld be removed. But if the lack of space is due to the narrowness of the jaws, it may be necessary to extract one or two of the permanent teeth in order to obtain space sufficient for the accommodation of the others.

Q. Is there any selection of teeth to extract when such a measure is to be resorted?

A. If the bicuspids or first molars are decayed it is better to extract such of these as are most decayed, but if all the teeth are sound and well formed the second bicuspids are the teeth most generally extracted.

Q. Why would you extract the second bicuspid in place of the first?

A. It is thus advised by some of our teachers, who contend that the first bicuspid will generally fall back into the space occupied by the second bicuspid, yet the experience of others indicate that *a forward tooth will rarely move backward*, while *a backward tooth will always or most generally move forward*, so that we rather incline to the extraction of the first bicuspid in preference to the second should all the teeth be sound.

Q. What is the most frequent kind of irregularity observed?

A. The prominence of the upper cuspids. When these teeth erupt outside of the arch between the lateral incisors and first bicuspids.

Q. Why is this so frequently the case?

A. Because these teeth are almost the last to erupt, except the second and third molars, and by this time the rest of the teeth have taken their position in the arch which frequently is so filled as to afford no place or no accommodation for these teeth.

Q. What, in such a case is the simplest remedy?

A. The extraction of the first bicuspids, when the cuspids will naturally (or by the mere pressure of the lips) fall or be forced into a proper position in the arch. Nevertheless, there are some practitioners who contend that as the bicuspids resemble the cuspids so closely it is as well in such cases to extract the cuspids.

Q. Do you favor such a procedure?

A. No.

Q. Why?

A. Because 1st. The cuspids are much stronger that the bicuspids. 2nd. They are less liable to decay. 3rd. They are prettier teeth. 4th. They may be looked on as the keystone to the arch of the jaw, viewing the jaw in two halves as they exist by the suture at the median line, and from its length of root more likely to keep the shape of the arch perfect than the bicuspids would do.

Q. Would any case of irregularity justify the extraction of one or both superior central incisors?

A. We can conceive no case where such an operation would be admissible.

Q. Could such extraction be practiced in the lower jaw?

A. Yes.

Q. Why do you make a difference between the upper and lower teeth?

A. Because the lower teeth are so nearly the same shape, width and size that the loss of one or two to relieve a crowded condition or to correct an irregularity is never apparent, so that the loss of one or two of these teeth is permissible.

Q. Is the extraction of an upper lateral incisor permissible?

A. In certain cases it is. Should the lateral incisor lay outside the arch between the central incisor and cuspid, and all the back teeth in proper occlusion, it would be preferable to extract the lateral incisor, than to disturb the articulation by the extraction of one or the other of the bicuspids in order to obtain room to draw the cuspid back so as to give space for the lateral to be drawn into line. Such a procedure would only be subjecting the patient to a long and tedious operation, with the chance of breaking up a correct articulation of the back teeth, which is of more importance than the slight disfigurement of a cuspid next the central.

Q. What is the simplest way of drawing two teeth together that are abnormally wide apart?

A. A ring of rubber tubing stretched over the two teeth.

Q. Would you merely apply such a ring of rubber to two such teeth?

A. No. I would use the precaution of tying the rubber ring to some adjoining tooth.

Q. Why would you do this?

A. Because it is found that these rubber rings have a tendency to work their way to the necks of the teeth, and even below the gum, creating great pain and soreness, and cases are on record where teeth have been extracted or forced out of their sockets by these rubber rings making their way to the very ends of the root. It is therefore a very necessary precaution, when using these rubber rings, to tie them to some adjoining tooth.

Q. Is there no way of preventing this except by tying the rings to neighboring teeth?

A. It has been suggested to wrap waxed ligature silk, or gilling thread, several times around the necks of the teeth before applying the rubber rings, and then applying the rubber ring above or below such ligatures, according as the teeth are in the upper or lower jaw.

Q. How are teeth regulated?

A. By applying force to the malplaced tooth in such a direction

as to bring it into line. To do this a firm buttress, or fulcrum is to be obtained. Such points must have strength without bulk. They should be small and so fixed as to neither irritate the gums or integuments of the mouth, be no impediment to the taking of food or the cleansing of the teeth. The positions to which teeth are to be moved are inward, outward, forward (or towards the median line), backward (or towards the distal line) and by twisting or rotation.

Q. How are these motions effected ?

A. The positions which teeth take in the jaw, are so numerous and diverse, that although dentists have endeavored to formulate a system, it has been found that each case has to be treated according to its own indications. It therefore would require an endless description of appliances to meet the demands of every case, and these descriptions however lucidly or clearly told, could never be so well understood as by illustrations. One of the first requisites, in undertaking a case of irregularity is to obtain an impression of the teeth, and from it, make a model, when by studying out the case, or searching in the works, devoted to this specialty of dentistry for a similarity, to make use of the appliances there indicated or a slight variation of such, to meet the case in hand.

[TO BE CONTINUED.]

A NEW OXYPHOSPHATE FOR CROWN SETTING.

BY W. B. AMES, D. D. S., CHICAGO, ILLS.

Read before the Mississippi Valley Dental Association, March 9, 1892.

There are few, if any, processes in which chemistry is applied of which the knowledge is more empirical than of the various cement formations.

The best authors do not attempt to give any definite information on the various mortars and hydraulic cements, and Oxycloride of Zinc is dismissed with the statement that the ingredients form a cement much used by dentists in the filling of cavities of teeth. Of Oxyphosphate of Zinc I have never been able to find a reference in any work on general chemistry.

Of the various oxy-phosphates offered for sale I am of the opinion, after examining a considerable number of them, that oxide of zinc is the basis and cement ingredient, other materials, such as silica alumina or magnesia in combination, acting only as modifiers of the plasticity before setting, and the hardness after setting, and do not enter into the crystallization.

After an extensive series of carefully recorded experiments I have

arrived at the conclusion that a very limited number of the metallic oxides have the property of forming a cement in combination with phosphoric acid and water. The oxides of zinc, copper and mercury only have this property according to experiments.

The salts of mercury being so very potent for evil, as well as good, render the oxides of this metal undesirable as ingredients of cements to be used in the mouth, so that the only practical addition that I have been able to make through my experiments to the cement family, is the higher oxide of copper. Of copper oxides we have the cuprous or red, and the cupric or black. The red cuprous oxide of copper forms a cement with phosphoric acid and water that has good working qualities, but shrinks badly in setting, lacks strength, and becomes friable with crystallization.

The black cuprous oxide of copper forms with phosphoric acid and water, in proper proportions, a cement which has desirable working qualities, and a hardness and stability after crystallization which gives promise of its being a valuable addition to our list of materials for use in filling cavities, and the attachments of crowns and bridges. The most valuable property is the ability to use a large proportion of oxide in the mixture without hurrying the crystallization of the mass. With an unusually large proportion of oxide the crystallization is sufficiently slow to allow of thorough mixing and deliberate handling while filling a cavity, or setting a crown or bridge. It is peculiar in that it retains its plasticity for an unusually long time upon a cold glass slab, but crystallizes rapidly under the effects of the warmth of the body. While it gives plenty of time for manipulation, it hardens rapidly after the process has once commenced, and is harder in a few minutes after being placed in the mouth than is usual with oxy-phosphate of zinc. The crystallization of this cement, when the proper proportion of ingredients has been used, seems to be more perfect than any of the zinc oxide cements that I have ever seen. There is a flint-like hardness such as I have never met with in any other oxy-phosphates.

If a pure oxide is used, free of metallic copper, there is no staining of the tooth material from impregnation. If metallic copper be present there is a gradual discoloration, similar to that from impregnation of the tooth material from some amalgams.

There is, undoubtedly, a powerful antiseptic influence exerted by the cement while in the plastic state, as there is a small amount of phosphate of copper formed during the mixing, which is soluble in the free phosphoric acid of the plastic cement, but insoluble in the

saliva after the crystallization has taken place. While the cement is hardening there is a distinct copper salt taste, which disappears when the crystallization is complete. This is analgous to the astringent acid taste from fresh oxy phosphate of zinc fillings, which comes from the phosphate of zinc formed in the combination. Hot phosphoric acid will dissolve a considerable amount of the metallic oxides, and a small amount is always dissolved in the cold state. The practical application of this is, that the use of the oxide of a metal whose salts are highly antiseptic insures a considerable antiseptic influence from the cement. In as much as phosphoric acid attacks the more electro positive metals readily, it is naturally suggested that we should be careful about using an unplated steel spatula in the mixing of oxyphosphates. If the phosphoric acid solution contains the proper proportion of water for best crystallization with the oxide used, this proportion may be modified to a detrimental extent by the combination of a portion of the acid with the metal of the spatula. A spatula of some of the more negative metals, or a steel spatula plated with negative metal is a more sensible instrument to use than one of steel only. The ivory spatula I would not consider as preferable to steel, but one of wood might in this connection be practicable, but for many reasons is inferior to thoroughly plated steel. A three inch druggist's spatula immersed in a strong solution of sulphate of copper, will become coated or plated with copper in such a manner as to make it a practical spatula for mixing this cement. This spatula should not be used for mixing any white cement as it is difficult to so thoroughly remove the black cement, that the other will not receive a decided tinge of the color. A glass slab from four to six inches square should be used.

DISCUSSION ON DR. AMES' PAPER.

Questions asked.

Q. Will it retain a polished surface?

A. It takes a glossy surface. Its main disadvantage is in the color, yet it does not stain the tooth.

Q. What other points in its favor?

A. It has the advantage of remaining plastic on a cold slab for a long time, giving plenty of time to the operator, in fact, my assistant often has the cement ready before I begin to work; after it gets the influence of the warmth of the mouth, it begins to crystallize and sets quickly.

Q. Is there any difference in mixing it?

A. Make it stiff.

Q. Does it mix as hard as cement?

A. About the same. You can mix it stiffer because it does not set so quickly on the slab. If mixed thin it does not set as hard.

Q. Is it adhesive?

A. It is very adhesive.

Q. Is it an irritant?

A. Not more so than Oxy-phosphate of Zinc, as the only irritant is the phosphoric acid used.

Dr. Cassidy.—It seems to me that this material is not a true chemical compound.

Dr. Ames.—I do not profess to say anything about the chemical part; it is my opinion that the phosphate of copper on account of its antiseptic properties should have the preference.

Dr. Heise.—Is this acted upon by the saliva, and does it stain the tooth?

Dr. Ames.—It is insoluble in the saliva. If the pure black oxide of copper is used there is no discoloration. I make use of it for filling children's teeth. Of course the black shows through the thin walls of the enamel, but where the pure oxide is used it does not discolor the tooth.

Dr. Morrison.—Have you experimented or produced any mixture to get rid of the color? For instance, mixing both oxide of copper and oxide of zinc with the phosphoric acid.

A. The difficulty is that each oxide requires a different consistency of phosphoric acid, but this might be found out by experience. This cement requires a larger proportion of water than any other I have ever seen, and this indicates that we obtain more perfect crystallization and consequently a more enduring filling. We would not get the best working qualities of either if used in combination, on account of the difference of specific gravity and crystallization of the phosphoric acid.

Dr. Morrison.—I have had trouble with ordinary cement getting hard while being mixed. What is the cause of this?

Dr. Ames.—Too much water in the acid.

Dr. Smith.—Dr. Jay has asked the question as to what cement is the best. Who knows much about it? A certain doctor told me this last summer that he made very enduring cement fillings, and I asked him how he did it, he said by taking care of the material, and through this precaution he obtained the best results, I think, however, that Dr. Taft put the matter about right when he once said that "the best oxyphosphate filling is only a poor filling." We deceive our patients

unless we tell them the true character of this filling. I would like to know of a good cement.

Dr. Wright.—Dr. Smith's remarks are rather discouraging; it seems to me that Dr. Ames has made a step in advance in this direction.

Dr. Smith.—It is a mistake to think that I was saying anything against Dr. Ames. His material is new, and I have not yet tested it. I have great respect for Dr. Ames' ability, and admire the interest he has manifested in this direction, and hope that he will yet discover some combination that will make a permanent filling of good color.

Dr. Ames.—I look forward to great improvements in cement fillings over anything we now have; there is a very great difference in what I have found in the results obtained. I have used this cement with better results than I have ever obtained from any other. It makes a much more enduring filling than oxyphosphate of zinc; where the phosphate fillings have stood only six months, fillings of this cement in the same mouth have stood for one and a half years. It withstands mastication better than oxyphosphate and has better edge strength. Its greatest advantage is in setting crowns, bridges, etc.

BOOK NOTICES.

The Rise, Fall and Revival of Dental Prostheses. Introductory lecture by B. I. Cigrand, B.S., D.D.S., Professor of Dental Prosthesis in the American College of Dental Surgery. Published by by request of Class 1892, Chicago, Ill. Severinghaus & Beilfuss, printers, 448 Milwaukee Avenue.

This work is the outcome of lectures delivered by the author before the class of the American College of Dental Surgery. It contains a history of dental art from its earliest times to its present advanced condition. It contains short interesting chapters, on Egytian, Hebrew, Chinese, Greek, Roman, Etrurian, European and finally American Dental art, which are very interesting and portrays the advance made from earliest times to the present day.

The work is well worth reading, and the author is to be complimented on amount of information contained in the brevity of his diction.—Ed.

Pamphlets Received.

Discussion on "The Desirability of Extraction of the Six Year-old Molar," by I. B Davenport, London. John Bale & Sons.

CALIFORNIA STATE BOARD OF DENTAL EXAMINERS.

Editor Dental Office and Laboratory, Philadelphia.

Dear Sir:—I am instructed to inform you for publication that at the last annual meeting, August 4, of the California State Board of Dental Examiners,—consisting of J. L. Asay, M.D., San Jose, President; S. E. Knowles, M.D., D.D.S., San Francisco; Jno. C. McCoy, D.D.S., Santa Ana; F. F. Tebbets, Sacramento; W. F. Griswold, San Francisco; Thos. Morffew, D.D.S., San Francisco; J. D. Hodgen, D.D.S., San Francisco, Secretary,—twelve applicants were examined, of which two were successful and the following officers elected: J. L. Asay, M. D., of San Jose, President, and J. D. Hodgen, D.D.S., of San Francisco, Secretary.

Trusting you may find space in your valuable journal for the same permit me to subscribe myself as, Yours fraternally

J. D. Hodgen, Secretayr.

THE PRACTICAL PLACE.

Removal of Stains.

It is not generally known that *starch*, moistened and rubbed over and on the stain left by the *Tincture of Iodine* will remove such a stain; also:

That the persistent and indellible stain left by the *Nitrate of Silver* may be removed as follows: First rub the stain of the Nitrate with *Tincture of Iodine*, and then remove this with *Liquid Ammonia.*

Fusible Metal.

Dr. C. M. Richmond says that the fusible metal which he uses for bridge work is as hard as zinc, and gives the following formula for making it (the metals to be melted together in the order named):—

Tin	20	parts by weight.
Lead	19	" "
Cadmium	13	" "
Bismuth	48	" "

This compound can be melted and poured into a plaster impression without generating steam, as it melts at 150° Fahrenheit.—*The International Dental Journal*

Sensitive Dentine Under Fillings.

A covenient method to diagnose for the tooth most affected is with a piece of zinc, which may be held with an instrument; having

wet the surface with the saliva of the mouth, touch the fillings as you would tap a tooth to detect soreness, the current will detect the tooth affected beneath the filling.—*Dr. S. B. Palmer in The Dental Cosmos.*

Cements.

The following formulas have been devised by Eugene Dieterich:

Cement of Pompeii, or Universal Cement.

Dissolve 8 ounces of sugar in 24 ounces of water in a glass flask on a water bath, and to the thin sirup add 2 ounces of slacked lime, keep the mixture at a temperature of about 70-75° C. for three days, shaking frequently, then cool, and decant the clear liquor. Dilute $6\frac{1}{2}$ ounces of this liquor with as much water, and in the mixture steep 16 ounces of fine gelatine for three hours after heating to effect solution. Finally add to the mixture $1\frac{1}{2}$ ounces of glacial acetic acid and 15 grains of pure carbolic acid.

Diamond Cement.

Fine gelatine	5 ounces
Water	4 ounces
Glacial acetic acid	1 ounce

Let these stand together for several hours, then heat to effect solution, and add ten grains of carbolic acid to preserve the cement.

Liquid Glue (Sydetikon).

For this use 4 parts of the above mentioned saccharated solution of lime and dissolve 6 parts of glue or gelatine in it as directed. Then neutralize the lime with a third part of oxalic acid, and add carbolic acid, in the above mentioned proportion as a preservative.

Cement for Porcelain.

Twenty parts of white lead and 12 parts of pipeclay, carefully dried, are incorporated with 10 parts of boiled linseed oil, heated on a water bath. The cemented articles are dried slowly in a warm place.—*Pharm. Centralhalle and Amer. Jour. Phar.*

As the gardener destroys all weeds and foreign growths about the vegetables he would produce, so must the gardener in ideas pull up, eradicate or destroy, all false or decaying ideas which sap the vitality from those he would have flourish.

To Solder Aluminum.

Messrs. F. J. Page and H. A. Anderson, of Waterbury, Connecti-

cut claim that surfaces of aluminum may be successfully soldered to each other, and to other metallic surfaces, by using silver chloride as a flux in conjunction with ordinary solder.

The pieces of metal, one or both of which are aluminium, are placed in the relative position required in the joint, finely powdered fused silver chloride spread along the line of conjunction, and solder melted on with a blow-pipe or other device. The joints are thus easily and rapidly obtained, and become hard and perfectly sound on setting, and neither crack, flake, nor check.—*Items of Interest.*

So the World Goes

Laugh, and the world laughs with you ;
  Weep, and you weep alone,
For this brave old earth must borrow its mirth.
  It has trouble enough of its own.
Sing, and the hills will answer ;
  Sigh ! It is lost on the air ;
The echoes bound to a joyful sound,
  But shrink from a voicing care.

Rejoice, and men will seek you ;
  Grieve, and they turn and go ;
They want full measure of all your pleasure,
  But they do not want your woe.
Be glad, and your friends are many ;
  Be sad and you lose them all ;
There are none to decline your nectared wine,
  But alone you must drink life's gall.

Feast, and your halls are crowded ;
  Fast, and the world goes by ;
Succeed and give, and it helps you live,
  But no man can help you die.
There is rooms in the halls of pleasure
  For a long and lordly train,
But one by one we must all file on
  Through the narrow aisles of pain.

John A. Joyce.

Reply to "Young Dentist" in February Items.

I have been using the formula you quote for painless extraction of teeth continuously, since it first appeared in the *Items.** Have never known of a case of swelling to follow its use. I inject from one to three drops right where I expect the beaks of forceps to press the gums. The removal of tooth will hurt some in almost every case,

but there will be no pain in grasping the tooth well up to the process, and no unpleasant results will follow. I have been using cocaine preparations in this way for a year and a half, and my success at removing badly decayed teeth and broken down roots,, have eclipsed all former efforts. The hypodermic needle, as it comes to us, is not properly pointed for this purpose. The taper at the point is so long that too much pain is caused by entering the gum far enough to confine the fluid. I grind down close to opening to the finest possible point. Should the needle become clogged, unscrew it, fill your syringe with water, replace the needle, and forcibly eject the water.—*Old Dentist.*

* The formula referred to is:

Cocaine hydrochlorate	20 grains
Sul. atropia	1-10 grain
Car. acid crystal	10 grains
Chloral hydrate	5 grains
Water	1 ounce

How to Obtain an Exact Impression of Root-Canals.

BY EDWARD G. CARTER, L.D.S., ENG. AND GLAS.

1. Shape the canal.
2. Mop it out with glycerine.
3. Fill it with pink gutta-percha—the kind supplied for taking impressions.
4. Heat a small French nail, press it into the canal, and leave the head projecting.
5. Take impression with modelling composition, and the gutta-percha will come away on the pin, thus enabling one to make a pivot with a maximum thickness of pin and a minimum quantity of cement.

The root should be roughened just before inserting the pivot.

"All vital manifestation is connected with the destruction of organic matter. When a muscle contracts or a brain thinks, it is at the expense of organic substance."

Polishing Instrument Points.

Put into a polishing cylinder (described below) the excavator points, burs, or other instruments, and put in with them about two teaspoonfuls of the finest flour of emery; close the cylinder; screw it to the lathe, and run at a good speed till all rust and spots are re-

moved; take off the cover and examine frequently; when clean, remove from the cylinder, pour out the emery, and wipe out. Put in one teaspoonful of crocus, two of clean sawdust, a little olive oil, and the points; put on the cover and run the lathe till polished to suit; remove from cylinder, and wipe off with chamois skin.

The excavator points should now be sharpened on an Arkansas stone. The engine burs can be nicely sharpened as good as new; either with a knife-edged Arkansas stone by hand, or with a round knife-edged stone in engine.

The Polishing Cylinder.—To make the cylinder for this work: Take a piece of seamless brass tubing, one and a half inches in diameter, inside measurement, and three inches long. Close one end by fitting in a bottom of heavy brass. Now make a heavy brass nut that will screw on to the lathe head; then solder this nut to the center of the bottom piece, and place the bottom in the cylinder, solder fast with soft solder. Next make a tin or copper cover, make it to fit on tightly, so that it will not come off during use.—Dr. Steele, *Items.*

Cocaine in Preparing Roots for Crowning.

Mr. E. Lloyd Williams uses a twenty per cent. solution of Cocaine Hydrochlorate for painting the surrounding gum, when preparing a root for crowning, and finds not only that the patient is saved much unnecessary pain, but that there is less weeping of the gum.

Aluminium is $2\frac{1}{2}$ times as heavy as water, while iron is $7\frac{1}{2}$, brass 8 times, copper 9 times, silver $10\frac{1}{2}$, lead 11, gold 19 and platinium $21\frac{1}{2}$ times.—*The Dental Register.*

"Study without reflection, is waste of time;
Reflection, without study, is dangerous."

"Sow an act and reap a habit, sow a habit and reap a character, sow a character and reap a destiny."

In a recent *Items*, some dentist says, "If rubber is closely confined in vulcanizing, its expansive force will break the blocks of teeth."

Another has said, "*Some* rubber would, and some would *not*."

Dr. White, of Yorkshire, asks: "How can these things be?"

Rubber doesn't expand while vulcanizing. Breaking occurs while

the flask is being screwed down in the press. The lower half of the plaster case, or that containing the cast, should only be extended up to the edge of the porcelain gums. Then the gums will be fully encased and pretected by the plaster of the upper half of the case, and no fears need be entertained of a break.—*J. H. Bogett.*

ETHER applied externally in front of and about the lobe of the ear will, it is claimed, anesthetize the trifacial nerve sufficiently to permit painless tooth extraction.

MOUTH WASH *antiseptic:*

Eucalyptol	220 grains.
Benzoic acid	45 grains.
Thymol	4 grains.
Alcohol	3 fl. ounces
Oil Wintergreen	25 drams.

—*Leffman.*

COUNTRYMAN (to dentist): "The tooth next to that 'un aches too, Doc."

Dentist: "Yes, it aches in sympathy."

Countryman: "Yank it out; durn sech sympathy!"

BORACIC ACID FOR CAPPING EXPOSED PULPS.

For the last year I have been experimenting in capping freshly exposed pulps, previous to which my success was so limited that my usual practice was to devitalise and remove them; but now they seldom give any trouble. Whether they will in the future is more than I can say. But this is certain—that I have never been able to keep them quiet so long before, only in exceptional cases. Whether it will prove as successful in the future as in the past is more than I know, but I think it will be well worth a thorough trial by the profession Care must be taken to wash out the cavity with a solution of boracic acid, so as to be sure that all the fresh blood is removed, and while it is still moist lay a small scale of dry boracic acid over the exposed portion, and then fill; it is stiff, and prevents undue pressure on the pulp, and takes the place of metal or court-plaster that some use for that purpose.

What drew my attention to it first was from the treatment of a gunshot wound in my little boy's arm. The ball passed through the fleshy part of the arm about midway between the shoulder and elbow.

An injection of a solution of boracic acid was forced through the opening on the opposite side of the arm, a tuft of antiseptic cotton was placed over both openings, and a bandage bound tightly over them running to the elbow. The bandage was not removed for three weeks, when it was entirely healed, no suppuration having taken place, which suggested the idea that possibly the same results might be obtained in recent exposures of the pulp. Subsequent experiments seem to be very promising, and I would recommend that the profession give it a trial.—W. H. Jackson, D.D.S., Ann Arbor, Mich., in *The Dental Cosmos.*

For sensitive dentine Dr. Bogue dips a pledget of cotton into carbolic acid, and then into powdered cocaine, and places it into the cavity. This obtunds sensibility enough to use granulated chloride of zinc with little or no pain. In ninety seconds the insensibility of the cavity is complete.

In cocaine poisoning the patient should be placed in a horizontal position. Bathe the face in cold water, let the patient inhale nitrate of amyl, give coffee or caffeine or inject ether sub-cutaneously, massage, flagellations, and artificial respiration should be resorted to if necessary.—*Review.*

Housework as an Exercise.

To keep the complexion and spirits good, to preserve grace, strength and agility of motion, there is no gymnasium so valuable, no exercise more beneficent in result than sweeping, dusting, making beds, washing dishes and the polishing of brass and silver.—*Medical Record.*

A correspondent of the St. Louis *Globe-Democrat* has discovered "a genuine and effective cure" for hay fever. It is a wash made of witch hazel and cocaine, to be applied to the nasal passages when the dreadful asthma comes on. He says it will stop the wheezing in no time, and then hay fever will have lost all its terrors.

Whooping Cough.

Common thyme, which was recommended in whooping cough three or four years ago by Dr. S. B. Johnson, is regarded by Dr. Neovius, who writes a paper on the subject in a Finnish medical journal, as almost worthy the title of a specific. During an epidemic of whoop-

ing cough he had ample oppportunities of observing its effects, and he came to the conclusion that if it is given early and constantly it invariably cuts short the disease in a fortnight, the symptoms generally vanishing in two or three days. They are, he finds, liable to return if the thyme is not regularly taken for at least two weeks. Regarding the dose, he advises that a larger quantity than Dr. Johnson prescribed be taken. He gives from one ounce and a half to six ounces per diem, combined with a little marshmallow sirup. He never saw an undesirable effect produced, except slight diarrhœa. It is important that the drug should be used quite fresh.—*Lancet.*

Business Maxims.

The elder Baron Rothschild had the walls of his palace placarded with the following maxims:

Carefully examine every detail of your business.
Be prompt in everything.
Take time to consider, and then decide quickly.
Dare to go forward.
Bear troubles patiently.
Be brave in the struggle of life.
Maintain your integrity as a sacred thing.
Never tell business lies.
Make no useless acquaintances.
Never try to appear something more than you are.
Pay your debts promptly.
Learn how to risk your money at the right moment.
Shun strong liquor.
Employ your time well.
Do not reckon upon chance.
Be polite to everybody.
Never be discouraged.
Then work hard and you will be certain to succeed!

Remedy for Ivy Poisoning.

Dr. James J. Levick of Philadelphia, writes to the *Medical News:* "In a case of poisoning of the hands from *Rhus toxicodendron*—poison oak—recently under my care, which had reached the vesicular stage and was attended with much swelling and burning, the happiest results promptly followed the free dusting of the powder of aristol on the affected parts. The change was almost magical, so sudden and

so prompt was the relief afforded. Might not this powder, applied in the early stage of the disease, do much toward preventing the ulceration and pitting of variola ?"

Ammonia and Its Uses.

IT SEEMS TO BE A SORT OF GENERAL BENEFACTOR TO HOUSEWIVES.

A little ammonia in tepid water will soften and cleanse the skin.

Spirits of ammonia will often relieve a severe headache.

Door plates should be cleansed by rubbing with a cloth wet in ammonia and water.

If the color has been taken out of silks by fruit stains ammonia will usually restore the color.

To brighten carpets wipe them with warm water in which has been poured a few drops of ammonia.

One or two tablespoonfuls of ammonia added to a pail of wate will clean windows better than soap.

A few drops in a cupful of warm water, applied carefully, will remove spots from paintings and chromos.

Grease spots may be taken out with weak ammonia in water ; lay soft white paper over and iron with a hot iron.

When acid of any kind gets on clothing, spirits of ammonia will kill it. Apply chloroform to restore the color.

Keep nickel, silver ornaments and mounts bright by rubbing with woolen cloth saturated with spirits of ammonia.

Old brass may be cleaned to look like new by pouring ammonia on it and scrubbing with a scrub brush : rinse in clear water.

A tablespoonful of ammonia in a gallon of warm water will often restore colors in carpets ; it will also remove whitewash from them.

Yellow stains left by sewing machine oil, on white may be removed by rubbing the spot with a cloth wet with ammonia before washing with soap.

Equal parts of ammonia and turpentine will take paint out of clothing, even if it be hard and dry. Saturate the spot as often as necessary and wash out in soap suds.

Put a teaspoonful of ammonia in a quart of water, wash your brushes and combs in this, and all grease and dirt will disappear. Rinse, shake and dry in the sun or by the fire.

If those who perspire freely would use a little ammonia in the water they bathe in every day it would keep their flesh clean and sweet, doing away with any disagreeable odor.

Flannel and blankets may be soaked in a pail of water containing

one tablespoonful of ammonia and a little suds. Rub as little as possible and they will be white and clean and will not shrink.

One teaspoonful of ammonia to a teacupful of water will clean gold or silver jewelry; a few drops of clear aqua ammonia rubbed on the under side of diamonds will clean them immediately, making them very brilliant.—*Scientific American.*

Remedy for a Cold.

In the *Scientific American* of December 2, 1876, we published the following remedy, which a correspondent, who has derived benefit from it, asks us to reprint:

The medical journals, last spring, published repeatedly the formula for Dr. Ferrier's new remedy for cold in the head. As the season for that distressing malady is at hand, we print the recipe, which is:

Trinitrate of bismuth, 6 drachms; pulverized gum arabic, 2 drachms; and hydrochlorate of morphia, 2 grains.

This is used as a snuff, creates no pain, and causes, says the London *Lancet*, the entire disappearance of the symptoms in a few hours.

An alloy of 78 per cent. gold and 22 per cent. aluminum is the most brilliant known.

To whiten the hands melt a pound of white castile soap over the fire with a little water. When melted, perfume slightly with any one of the extracts, and stir in half a cupful of common oatmeal. Use this preparation when washing your hands, and you will be surprised at the improvement in their appearance.—*Cincinnati Enquirer.*

Dissolving Caoutchouc.—Caoutchouc can be dissolved more readily by adding from 5 to 15 per cent. of oil eucalyptus to the benzol or carbon bisulphide used; in the latter proportions, the mixture of carbon bisulphide will dissolve nearly 20 per cent. of caoutchouc.

Coffee Kills Germs.

Coffee has disinfectant properties. Only recently a Dr. Luderitz has studied in detail the germ killing action of coffee infusions. Using by no means strong infusions, he showed that a certain harmless microsoccus germ dies in ten per cent. coffee solution in from three to five days. The bacillus of typhoid fever perished in from

one to three days under the coffee influence, and the cholera bacillus in from three to four hours. The germ of anthrax or splenic fever died in from two to three hours; but the spores of young forms of the latter germ perished in from two to four weeks only. These latter results speak well for the power of coffee as a germicide, for anthrax germs and spores are by no means easy to scotch or kill. Possibly after these revelations coffee administered internally, may be utilized as a remedy for germ produced diseases. As it is, its virtues as a reviver and "pick-me-up" have long been appreciated out side the medical world.

TO REMOVE a wart, cover the skin around the wart with lard, apply over the surface of the growth one or two drops of strong hydrochloric or nitric acid; then keep the part covered up until the scab separates.

FROM the same source we learn artificial ivory is made by coagulating milk as one would in making cheese, and then mixing with the solid portion borax, and submitting the mass to high pressure. The material thus formed, which goes by the name of "lactite," is well fitted for the manufacture of such things as pen holders, pipe mouth pieces and combs, being both hard and durable.

DENTISTRY AND DOLLARS.

THE dentist who values his time and advice is the man who is appreciated.

He who sells himself for nothing, generally gets all he is worth.

He who goes for half price, when patients are able to pay a reasonable fee, goes for more than he would bring on the market.

A community never values a dentist higher than he values himself.

He who works for love may gain the reputation of a good Samaritan, but good Samaritans are not all good dentists.

No greater mistake was ever made than to impress the community that dentists are poor business men. Straightforwardness, promptness, reliability and firmness are elements by which a man's qualifications are determined.—*Exchange.*

CHRONIC BRONCHITIS.

In cases of chronic bronchitis, with difficult breathing and scanty expectoration, the use of banana juice has been highly praised. The juice is prepared by cutting up the bananas in small pieces, and

putting them with plenty of sugar in a closed glass jar. The latter is then placed in cold water, which is gradually made to boil. When the boiling point is reached the process is complete. Of the syrup so made a teaspoonful every hour is the proper dose.—*Medical and Surgical Reporter.*

THE DOCTOR:

The skin of a boiled egg is the best remedy for a boil. Carefully peel it, wet and apply to the boil.

For simple hoarseness take a fresh egg, beat it and thicken with pulverized sugar. Eat freely of it.

The juice of half a lemon in a teacup of strong black coffee, without sugar, will often cure a sick headache.

Castor oil may be comfortably taken in hot milk, in hot water sweetened and highly flavored with essence of peppermint or wintergreen.

A sure cure for inflammatory rheumatism is made by taking one ounce of pulverized saltpetre and putting it into a pint of sweet oil. Bathe the parts affected.

For neuralgia in the face apply a mustard plaster to the elbow. For neuralgia in the head apply the plaster to the back of the neck. The reason for this is that mustard touches the nerves the moment it begins to draw or burn, and to be of most use must be applied to the nerve centres, or directly over the place where it will touch the affected nerve most quickly. Let the patient have plenty of sunlight. The tradition of the value of a darkened room has long ago been discarded by wise nurses.—*Hall's Journal of Health.*

I THINK my experience ought to justify me in maintaining, or at least expressing the opinion, that amalgam, when properly manipulated, will preserve the teeth. I have practiced in one place thirty years, and have seen fillings recently that I put in many years ago, and I have recently seen an amalgam filling made in the first years of my practice that was preserving the tooth perfectly. I think good amalgam, skillfully manipulated, will preserve the teeth as well as any other material.—*I. Douglass, in Ohio Journal.*

ETHER AS AN ASSISTANT OF DIGESTION.

THE effect of ether on the digestive processes in healthy subjects has been recently investigated by Dr. Gurieff, who gave thirty drops of sulphuric ether to six healthy persons during dinner, which con-

sisted of about half a pint of soup, four ounces of meat, and six ounces of bread. It was found that the ether had the effect of stimulating the action of the gastric glands, increasing the free hydrochloric acid in the gastric juice, and causing the peristaltic movements of the stomach, together with its power of absorption; to increase; thus on the whole exercising a favorable effect upon the gastric digestion. The same result was obtained when the ether was administered by means of hypodermic injections. It would appear, therefore, that the effects must be ascribed to a general rather than to any merely local action on the mucous membrane of the stomach. Dr. Gurieff is disposed to think that there is a stimulation of the cephalic centres. This view is partly based on the observations of other Russian observers—Bektereff and Miloslevski, and Pavloff and Shumova-Simanovskaya—on the dependence of the gastric functions upon the central nervous system.—*Lancet.*

How to Drill Glass.

Tell your correspondents if they wish to "drill glass," and do it successfully, to make a drill of the required size out of a bit of Stubs steel wire. Make the cutting edge just like a stone drill, having the corners square and sharp. Heat the drill with the blowpipe to a white heat and drop it instantly into water. A few trials will get it hard enough. Rotate the drill in a small drill stock, keeping the cutting edge wet with a solution of camphor in turpentine. Sharpen the drill occasionally on an oil stone. Such a drill will cut a hole through plate glass three-eighths inch thick in about one minute. If the glass is thin, paste writing paper on each side with common mucilage.

A little practice is necessary with this as with everything else, Having tried about every way mentioned in the books, I can say that this is the only way ever tried which did not end by breaking the glass. C. W. N.'s three-cornered file always broke my Holtz plates.—John W. Kales, M. D., in *Scientific American.*

Coloring Brass a Deep Blue.

A cold method of coloring glass a deep blue is as follows: 100 grammes of carbonate of copper and 750 grammes of ammonia are introduced in a decanter, well corked, and shaken until dissolution is effected. There are then added 150 cubic centimeters of distilled water. The mixture is shaken once more, shortly after which it is ready for use. The liquid should be kept in a cool place, in firmly

closed bottles or in glass vessels, with a large opening, the edges of which have been subjected to emery friction and covered by plates of greased glass. When the liquid has lost its strength, it can be recuperated by the addition of a little ammonia. The articles to be colored should be perfectly clean; especial care should be taken to clear them of all trace of grease. They are then suspended by a brass wire in the liquid, in which they are entirely immersed, and a to-and-fro movement is communicated to them. After the expiration of two or three minutes they are taken from the bath, washed in clean water, and dried in sawdust. It is necessary that the operation be conducted with as little exposure to the air as possible. Handsome shades are only obtained in the case of brass and tombac—that is to say, copper and zinc alloys. The bath cannot be utilized for coloring bronze (copper-tin), argentine, and other metallic alloys.

New Process of Nickel-Plating.

MM. Mond, Lang, and Quincke have recently shown that when carbonic oxide is passed over pure nickel maintained at 30° C. (86° F.), the two substance unite, forming a gaseous substance, which may be condensed into a liquid, boiling at 43° (109.4° F.). This liquid is exceedingly volatile, and dissolves readily in coal-oil or benzine. It is decomposed, either in the gaseous or liquid state, or in state of solution, by a very slight rise of temperature, giving off carbonic oxide and depositing a very hard, brilliant, and white film of nickel. In order to make practical use of this fact all that is necessary is to immerse the object to be plated in the liquid, the solution, or even in the gas, and slightly raise the temperature beyond 110° F. Deposition is made at once. Plaster casts, paper, or any other substance, may be plated by first giving them a conducting surface by rubbing with graphite. The nickel should be as near pure as possible, that resulting from the decomposition of the oxide by hydrogen being the best.

Crowning Frail Roots.

A narrow band is fitted around the neck of any root, a cap placed on the top of that, and a pivot fitted in the root and through the cap, the whole being then soldered together. One or two vent-holes are then drilled through the top of the cap, and is set to place with oxyphosphate, the excess coming out through the holes. These holes are then reamed out and filled with gold, and the edge of the band under the gum is burnished to the root. The tooth is then fitted to this cup

and set on the projecting pivot with oxyphosphate. The advantage of this plan is that the root being slightly tapered with proper paring instruments, the band can be made to fit absolutely, while the excess of oxyphosphate is gotten rid through the vent holes instead of being squeezed out around the edge of the band. The crown used is similar to the Howland crown. Another method employed with these, as well as the old fashioned pivot teeth, is to prepare the root even with the outline of the gum, and set a pivot into it with oxyphosphate. The end of the root is cut very smooth and even and the base of the crown accurately fitted. A mat is made of several thicknesses of soft gold No. 5, and a clean hole cut in the centre of it, of the size of the pivot. It is then put over the pivot as a washer, and the tooth set with oxyphosphate. If in time the cement wastes, the gold remains to preserve the root.—Dr. S. G. Perry, in New York Odontological Society, reported in the *Cosmos.*

Wonders in Miniature.

In a museum of curiosities at Salem, Mass., there is preserved a common cherry seed or stone, hollowed and fashioned like a basket. Within the basket are twelve tiny silver spoons, the shape and finish of which cannot be distinguished with the naked eye. The name of the artist who constructed this little wonder has been lost, but the actual existence of the thing itself will not be questioned by any one from the Old Witch headquarters of the Bay State.

Dr. Peter Oliver, who lived in England during the early part of the Eighteenth Century, tells of seeing a carved cherry stone which would be a wonder even in this age of fine tools and fine workmanship. The stone was one from a common cherry, and upon it were carved the heads of 124 popes, kings, queens, emperors, saints, etc. Small as they must necessarily have been, it is announced on the authority of Professor Oliver that with a good glass the heads of the popes and the kings could readily be distinguished from those of the queens and saints by their mitres and crowns. The gentleman who brought this little wonder to England purchased it in Prussia, allowing the original owner £5000 for his treasure. Think of it, $25,000 for a cherry seed!

Counting Dust Motes.

Who would think that science could devise an apparatus or instrument for counting the number of dust motes that dance in a bar of sunlight? No one would imagine that such an unheard feat could be carried out with any degree of accuracy, but, if we are to believe offi-

cial reports, that and much more has recently been accomplished by the microscopists. At the Ben Nevis Observatory, Scotland, an attempt has been made to determine the relative purity of the atmosphere. The maximum number of dust particles in a cubic centimeter of air examined with a high grade microscope at the Ben Nevis Observatory has be found to be 12,862, from a "specimen" examined on March 30, 1891. The minimum is fifty-two particles to the cubic cenimeter from an examination made on June 15. 1891. At one time a difference of some thousands of particles noted within a few hours. Observations were taken at 12 M. and again at 6 P. M. The first showed but 26,785 particles, the last 12,682.

The Contraction of Rubber Plates.

The fact is well established that vulcanite contracts in cooling, and, in consequence, dental plates made up with section teeth almost invariably warp, and require more or less manipulation before a satisfactory fit is secured. In the case of upper plates the change is quite apparent, the rear palatal portion being thrown up, causing the plate to rock. The arching up of this part of the plate is caused by the contraction of that portiou immediately behind the teeth, the thin palatal part acting as a stay, and diminishing to some extent the amount of change experienced.

When, in repairing an upper plate, the center portion is sawed out, it will be found that its heels will spring together, certainly as much as the amount removed by the saw cut, and sometimes even more. This shows that the same action takes place with lower plates, and to a greater extent than with upper ones. As they leave the vulcanizer, full lower plates, with section teeth, are always sprung together at the heels, and are too narrow for the mouth. If they are re-vulcanized, they are thereby made still narrower, and are, therefore, in many cases, not capable of being worn with comfort. If they are heated sufficiently to soften the rubber and are then widened, the beneficial effect on the fit will be quite apparent.—Dr. Snow, in *Practitioner and Advertiser*.

Mortality in Different Occupations.

M. Bertillon, in a paper presented at the Congress of Hygiene in London, shows the mortality of persons in different occupations based on statistics of the city of Paris. The average is made for each year of life, by which system different results are obtained than when the average age at death is taken as a basis. The highest rate is among

cabmen, undoubtedly on account of their exposure to the weather. The drivers of other vehicles are more long lived. Saloon-keepers, although showing a higher mortality, are longer lived than in England. The mortality, is higher where mechanics work is in an atmosphere laden with dust, and especially if the dust is hard and gritty; metal-workers and stone-cutters show a higher mortality than bakers. Tailors and shoemakers show a mortality above the normal, possibly because these trades are sought by men of weak constitution. The trade of blacksmith, also, is apparently not conducive to long life. As in England and Switzerland, where similar statistics have been published, the longest lived persons are priests, gardeners and school teachers. In regard to physicians, the statistics of Paris differ from those previously obtained. The Parisian physician has a good prospect of a long life. This is undoubtedly, due to the different life led by a city and country practitioner. It is to be noted that in Switzerland, although the doctors died young, their children have a low mortality. The length of life of the small class, which by reason of wealth have no regular employment, is below the average.

Simple Method of Curing Obesity.

In a French journal (Paris correspondence *Jour. Am. Med. Asso.*) is announced the discovery of a means, as simple as it is strange, for curing obesity, which is attributed to a medical officer in the army. Thanks to this means, a colonel who was threatened to be obliged to retire from the army, as he was so heavy that it required two men to lift him into the saddle, became thin in a few weeks, and to such an extent that he had to take means to recover, in a measure, what he had lost. It was to his doctor that he was indebted for becoming a general. The means consisted in never eating more than one dish at each meal, no matter what that dish may be, and a person may consume as much as the stomach can bear, and satisfy the appetite without the least reserve. Nevertheless, nothing but the one dish should be taken; no condiments, or soups, or supplementary desserts should be allowed. This system was recommended to a lady who was slightly obese, and who put it into practice with the best results. The lady observed that she suffered no inconvenience whatever from this diet, and the result obtained by the medical officer may be well understood, as she found by her own experience that the partaking of only one dish, whether it be meat, fish or vegetables, brought on a sense of satiety much sooner than if she had partaken of a variety of dishes, whence the effect of relative abstinence.

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[SEVENTEENTH PAPER.]

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Continued from page 6, Vol. VII, No. 1.)

ACONITE.

The source of aconite is from a perennial plant called the *Aconitum Napillus*, which grows profusely in the mountains of Europe and Asia. It is also known by the names of *Wolfsbane* and *Monkshood*. It is obtained from the root of the plant. It is a violent poison. Used for neuralgic affections of the fifth pair of nerves, very good results have been obtained. When applied externally it produces a sense of heat and pricking which is succeeded by a numbness. In making the tincture twelve troy ounces of the root is employed to two pints of alcohol. The internal dose of the tincture is from *one* to *five drops*.

Uses. Aconite is employed by the dentist in all inflamatory or febrile indications. Combined with equal parts of *Chloroform* it gives almost instant relief from pain after the extraction of a tooth, when applied *on* a pellet of cotton in the socket of the extracted tooth. Combined with equal parts of *Iodine* it is used with favorable results in the first stages of inflamation of the peridental membrane. Before making such application the gums should be wiped dry. It has been used with favorable results for toothache, by applying a drop or two in the cavity, from which all decomposed food and other foreign matter have been removed. It has a local anæsthetic effect when used with equal parts of chloroform for the extraction of teeth. It is also combined with chloral, pyrethrum, morphia and other drugs, as a local anæsthetic agent. Of its potency as *an active poison, 15 drops of the tincture* (and less of the *extract*, which is more powerful) have been known to kill. The *symptoms of aconite poisoning* is a sense of weariness in the legs, a partial blindness or indistinctness

of sight, the pupils of the eyes are very large, the breathing is short and difficult, the pulse is slow, the perspiration is excessive, the tongue feels cold and breath is cold. *The antidotes* are *brandy* and *ammonia* with heat externally applied. As a local anæsthetic for the extraction of teeth the following has been suggested :

℞ Tincture Aconite ....ounces iss
Pyrethri.................................drachms iij
Veratrinæ........ ....grains x
Morphia, sulphate........................ grains iv
Rectified Spirits.........................ounces iv
Hydrate Chloral...........................grains iv

Macerate for four days and then filter for use. It is used by wiping the gums dry over the tooth to be extracted, and applied for a minute or more before extraction.

ALCOHOL.

Alcohol is obtained by distillation from fermented liquors, or from what is known as a mash in the process of brewing beer. It is in color like water, very inflamable, and very volatile, and frequently contains such impurities as *Fusil oil*, which is an oil derived from corn and other grains.

Absolute Alcohol is alcohol deprived of all water. It is obtained by agitating alcohol with heated carbonate of potassium, which deprives it of all water.

It is used by the dentist in making shellac and sandarac varnishes for laboratory use, as also for the latter in use at the operating chair. Its excessive affinity for water makes it valuable for dehydration, whereby the dentine may be cut with much less pain. Combined with *tannic acid* or *chloride of zinc*, it is a valuable obtundent of sensitive dentine. It is a valuable deodorizer and detergent, and for this purpose is used to cleanse root canals previous to filling. It combines readily with oils and resins, and enters largely in the manufacture or composition of tinctures and mouth washes. As a dehydrating agent *absolute alcohol* is used. The dentist may prepare this for himself by adding *one part* of carbonate of potassa to *four parts* of ordinary alcohol. As a dental obtundent the following is offered.

℞ Absolute Alcohol...... .... ½ ounce
Tannic Acid ....½ ounce
Glycerine ....½ ounce M.

AMMONIA.

Ammonia is obtained by the distillation of animal matters. It exists most commonly in the form of gas, which is dissolved in water

forming the ammonia of commerce. It is composed of three parts of hydrogen and one part of nitrogen. The dose is from five-sixteenths to a half drachm. It is used by the dentist as a stimulant in cases of fainting, or in dangerous narcosis from the effect of anæsthetic agents. It is likewise useful for removing the phosphate of zinc filling material, which adheres to the instruments used for packing this into a tooth cavity. Very useful to relieve the pain caused by the sting of bees, fleas or other insects, and even for the bites of snakes or rabid dogs. For cleansing root canals, and for adding (a few drops) to water in the wash basin for removing the odor from the hands while treating putrescent pulp canals, or to make the hands soft, smooth and pliable while at work. It is also said that if the semi-vulcanized rubber, which is sold in strips, at the depots, and used by the dentist for separating the teeth before filling, have grown stiff from age by soaking them in weak ammonia and water their elasticity will be restored.

AROMATIC SULPHURIC ACID.

This medicine is a compound of the acid, combined with aromatics and alcohol, such as ginger and cinnamon. It has tonic and astringent qualities. The use made of it by the dentist is in the treatment of Pyorrhea Alveolaries, and in caries or necrosis of the maxillary bones, diseases of the Antium of Highmore, as a gargle in mercurial stomatitis, ulcers on the mucous membrane of the mouth, and in the treatment of chronic alveolar abscess, used in such cases for injecting along the fistulous tract. Used as a gargle it should be diluted and used for the treatment of diseased bone, the teeth should be protected from contact with it by properly folded napkins.

As a gargle the following formulæ is offered.

℞ Sulphuric Acid .... $\frac{10}{16}$ of a drachm
Decoction of Barley .... 4 fluid ounces
Honey .... $\frac{1}{2}$ fluid ounce

For carious bone, Rigg's disease, etc.:

℞ Aromatic Sulph Acid .... 3 fluid drachms
Tinct. Capsicum .... 10 drops
Water .... 2 fluid drachms

ARSENIC.

Arsenic is a metal. It is prepared by digesting the metal in dilute nitric acid. The metal is a steel-gray color, brittle and crystaline, and is generally found in cobalt ore. It is obtained by washing the ores and purifying by sublimation. It has no odor, but when heated to a dull red color emits an odor like garlic. It is often adulterated with chalk or lime. It has scarcely any taste except a very slightly

sweet one. It may be taken internally in very small doses, when it acts as a tonic, improving the appetite, and improving the secretions, but in large doses it is an irritant poison. *The dose* is from one-sixtieth to one-twelfth of a grain.

The symptoms of arsenical poisoning in the intestines are violent vomiting, excessive dryness of the mouth, intense thirst, bloody and offensive stools, retracted abdomen, suppression of the urine, or this may be mixed with blood, rapid and feeble action of the heart, oppressed breathing, great agitation and restlessness, shrunken features, cold breath, involuntary evacuations, collapse; consciousness continued to the end. The effect, even when not fatal, is felt for a long time after in irritability of the stomach, irritable condition of the skin, stiffness of the joints, neuralgic pains, numbness, a sensation similar to that produced by a number of ants crawling over the body etc. Death generally occurs in the midst of a convulsion, followed by a rigid spasm of the whole body.

Its dental uses are principally for the devitalizing of the dental pulp. For this purpose it is generally combined with the sulphate or acetate of morphia, and made into a paste with creosote or carbolic acid, the morphia being added with the view of mitigating the pain caused by using this irritant alone. Despite of this, however, severe pain is frequently experienced when used even with these drugs, and this has caused considerable experimentation. The experiments of Prof. Jas. Truman and Dr. E. C. Kirk, have been referred to in these papers.

Arsenic is readily absorbed by the dentine, so that it has to be used with considerable caution in very vascular teeth. In the teeth of young persons, which may not be entirely developed, it is contraindicated. In such cases the pulp may be destroyed by repeated applications of pepsin made into a paste with carbolic, or with tannin used with the same.

Arsenic was, and may still be used as a powerful obtundent to sensitive dentine, but the use of it for this purpose is reprehensible and is generally cried down by the profession, as it almost invariably results in the death of the pulp from the dentine absorbing it.

The quantity of arsenic used to devitalize a pulp is excessively small. A quantity in bulk no larger than a pin's head, while in weight from one-twenty-fifth to one-hundredth of a grain being sufficient.

One application if made to the actually exposed pulp is generally all that is required, but if the application has to be made over a thin lamina of dentine, it may require other applications. This is more

frequently the case in very dense teeth rather than those that are highly organized.

The arsenic is allowed to remain in place about twenty-four hours. But in our practice we have never observed any untowards results by permitting it to remain a longer time.

The application should be made with considerable care, especially in the cases of large proximate decay, least the irritant ooze out of the cavity and attacks the gum, which if it do would result in violent inflamation whereby the socket might be involved, and which might result in necrosis of the bone. In such localities it is best, *always* to apply the rubber dam, or in lieu of this a rope of jap. bib. paper may be steeped in sandarac varnish and packed into the interspace, and then the arsenical application made. Being applied it is prevented from escaping into the mouth by sealing it into the cavity with adhesive wax, with temporary gutta percha filling, or with a pellet of cotton steeped in Sandarac Varnish. Either of the two former methods is preferable to the latter.

Sometimes a tooth may be so dense, or the patient so insusceptible to the action of arsenic, that it fails to produce the object sought. When such is the case the pulp must be laid bare and made to bleed by pricking it with a fine probe. But to do this the overlying dentine as well as the pulp should be so obtunded as to prevent the excessive pain that would be given without these precautions.

It must not be supposed in the use of arsenic that if "a little is good a great deal is better." Such is not the case, for if too large a quantity be used it will cause such violent inflamation as to give not only great pain, but to prevent the pulp from absorbing the agent. Arsenic is sometimes used to destroy a fungus growth of the dental pulp, and lately it has been advocated as one of the materials for root filling.

BI-CHLORIDE OF MERCURY.

Bi chloride of Mercury, or Corrosive Sublimate, as it is also called, is obtained by subliming a mixture of chloride of sodium and mercuric sulphate. It is in the form of white crystals. It requires from fifteen to sixteen parts of water to dissolve it, but it dissolves more readily in alcohol and ether.

It is considered the Prince of Germicides, and is used in the treatment of alveolar, abcess, putrescent pulp canals and pyorrhœa alveolaris. As a germicide it is 250 times more powerful than carbolic acid. A solution of one part of the salt with 20,000 parts of water has been known to destroy germs in ten minutes.

Dr. W. D. Miller does not recommend its use diluted to such an

extent. He says that a solution of 1 to 1000 is only one-fifth as powerful as pure carbolic acid. He would use it from one-half to one per cent. for sterilizing root canals, when such use is made of it with the rubber dam in position. One grain of the salt to four and one-half ounces of the water makes a solution of a strength of 1 to 2000.

A combination is recommended by Dr. Black, of Mercuric Chloride, grains ij and peroxide of hydrogen, fluid ounce j, for injecting into the pockets of pyorrhœa alveolaris, and in alveolar abcess.

The bichloride of mercury is considered the most effective for the treatment of such cases in the oral cavity, where a germicide disinfectant and antiseptic is indicated. The excessive dilution of it—ordinarily 1 to 1000, or 1 to 2000—makes it almost harmless despite its highly poisonous character.

The internal dose is limited to one-thirtieth or one tenth of a grain, and the antidote is the white of an egg, wheat flour, or large quantities of milk.

Besides its use in the treatment of alveolar abcess, etc., it is recommended as a lotion or gargle in diseases of the mucous membrane of the mouth of a strength of 1 to 1000.

[TO BE CONTINEUD]

[FOURTEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

Q. What is considered the most important operation of Dental Surgery?

A. The treatment of dental caries.

Q. Is this disease amenable to treatment?

A. Experience has proved that it is.

Q. How is it performed?

A. In cases of *superficial* caries, the diseased part is removed by files, chisels, disks, etc., and the part thus treated highly polished. And in cases of *deep seated* caries, the diseased part is thoroughly removed with appropriate instruments, and the cavity thus formed filled with such substances as experience and experiment have proved to be able of arresting further decay.

Q. What tissue covers all teeth?

A. The enamel.

Q. In the treatment of either kind of decay do you not remove the enamel?

A. We do.

Q. Then as the enamel is known to be the hardest of all animal substances, and was evidently put on the teeth as a protection to the softer underlying dentine, are you sure you are right in removing it in treating these kinds of caries?

A. It would seem that such a procedure would be wrong, yet experience proves that when this tissue is removed, and the teeth judiciously and skillfully cut, and subsequently highly polished, the exposed surface of the softer dentine does not decay.

Q. To what do you attribute this?

A. To the manner in which the operation is performed, and to the high polish left on the surface.

Q. Why should a high polish have anything to do with the non-recurrence of decay?

A. The high polish alone would not prevent a recurrence of decay, but when it is combined with such a separation from the adjoining tooth, which would prevent the surface thus operated on from coming in contact again, then the operation becomes effective.

Q. Is this always the case?

A. We will not go so far as to say always; but in teeth of good characteristics, of a hard flinty nature, in persons of good organisms, etc., the operation, when judiciously performed, has proved very successful.

Q. Do all teeth decay with the same rapidity?

A. No. Hard, yellowish, compact teeth decay very slowly, even after caries have reached the dentine, while other teeth decay in proportion to their organism; the quicker accordingly as they are vascular or poorly organized.

Q. What should be the advice of the dentist to his patients having teeth of the latter class?

A. To pay frequent visits, that the teeth may be examined and decay arrested in its incipiency.

Q. Should the file or disk be used in the treatment of decay at any time, whether for the removal of weak margins in a deep-seated caries or otherwise?

A. If the tooth requiring treatment, or a contiguous tooth be decayed, such teeth should not be filed if the patient be suffering from local, or acute inflammation; so that the treatment for the suppression of the inflamation should precede the uses of the file.

Q. What should be the course adopted before commencing the treatment of dental caries?

A. All useless roots that are causing irritation, or are the cause of

alveolar abscess, should be removed, and all deposits of tartar well and thoroughly cleaned off. With the mouth and teeth thus prepared, the dentist will advance his work better than if these were left "for the last."

Q. Should a cavity of decay be filled, whenever an operation of the kind is demanded?

A. No. The mere filling of such a cavity will not give comfort or cause the cessation of toothache. It will often do the reverse. It is therefore necessary for the dentist to exercise judgment when such applications are made for service.

Q. If in the preparation of a cavity of decay the preparation give absolutely no pain, should such a cavity be filled?

A. The dentist should be careful how he would fill such cavities, as they frequently prove delusions. The very fact of entire painlessness, proves the death of the nerve, and if this organ be dead, the chances are that the tooth will cause pain after it is filled. In many cases such teeth give no pain, either before or after filling, yet it is better to remove the dead nerve and thoroughly treat and disinfect the root canals, than run the risk of after trouble.

Such treatment is of a more sanitary nature than the simple filling of the cavity, yet if this be done, under the circumstances we have alluded to, the tooth would be better filled first with gutta percha—which is easy of removal in case of after trouble—than with any harder filling material.

Q. Has not the filing of the tooth been regarded as a predisposing cause of decay?

A. It has.

Q. Then why file the teeth?

A. Because it is done as a remedial agent, and proves a predisposing cause only *when improperly performed.*

Q. What is the object of filing the teeth?

A. 1st. To remove superficial decay; 2nd. To keep surfaces apart that were formerly held in close contact; 3rd. To smooth rough edges of extensive decay before filling.

Q. How do you answer that the mere keeping of the proximate surfaces of the teeth apart tends to defeat decay?

A. If I may answer by and example I would say that a handful of gunpowder may be held in one hand, while a brand of fire may be held in the other; as long as these are kept apart nothing ensues; it is only when the two are brought in contact that trouble ensues. In like manner if decay be removed from the proximate surfaces of two

teeth, and these surfaces prevented, by skilful operating, from again coming in contact a recurrence of decay will be prevented. While we assert this, it must not be regarded as without exception, as we find teeth so poorly constituted to resist corrosive action, that almost all operations to prevent decay seem abortive, so that we have to treat and retreat such teeth again and again in our efforts to preserve them.

Q. What is thought to be the cause of decay?

A. The contact of corrosive agents.

Q. Which tissue of a tooth seems to be most easily acted on.

A. The dentine.

Q. How can corrosive agents act on the dentine when this tissue is covered by the enamel?

A. Sometimes by cracks, fissures, or imperfections in the enamel; also if the enamel be examined by a high magnifying power, the rods or hexagonal prisms of which it is composed reveals imperfections (in poorly developed teeth, or teeth highly organized or very vascular), at points where these prisms are in contact, and these imperfections are of such magnitude, as readily to permit corrosive agents reaching the dentine, and it is thought that the whole disorganization of a tooth might be effected in this way; while the external form of the tooth reveals no decay in the enamel whatever.

Q. If decay recur after the teeth have been well and skilfully filed apart to what is this sometimes due?

A. Sometimes to the carelessness of the patient.

Q. What should be the instruction of the dentist to his patient when teeth have been thus operated on?

A. To cleanse the filed and polished surfaces thoroughly *at least three or four times a day—certainly after each meal*, and to be sure that all small particles of food—*particularly animal food*—be removed. This advice is the more requisite in persons who have soft, chalky teeth.

Q. How does the dentist err in the operation of filing teeth?

A. Either by filing too little or too much. By filing too little the surfaces are often brought in contact again by a change of position in the teeth, or if not this by the space being so limited as not to prevent the action of corrosive agents. On the other hand, if filed too much, the teeth are unnecessarily disfigured in shape, or the pulp may be so nearly approached as to cause its death by thermal action of food. Nevertheless the larger number of failures of this operation traced more to too little than too much filing.

Q. In filing the front teeth for the removal of superficial decay, or as a preliminary to filling, what objects should be kept in view?

A. 1st. The entire removal of all decay; 2nd. the thorough polishing of such surfaces; 3rd. The filing or cutting of the tooth in such a way as not to mutilate or disfigure it, and at the same time to keep the surfaces thus operated on, whether for the removal of superficial caries, or for the insertion of a filling, from coming in contact again.

Q. Is this accomplished by the file alone?

A. No. In part by the file, the chisel, the disk in the dental engine, or by small corrundum wheels and points used in the dental engine.

Q. If only one tooth is found decayed what kind of file would you use?

A. What is termed "a safe sided file" which is a file having teeth cut on its edges, *and on one side only*—the other side being smooth so as not to touch or abraid the tooth that is not decayed.

Q. How should the file be held, and how should the operator stand?

A. The operator should stand on the right side. His left arm should be thrown around the head of the patient, while the head rests in the head-rest of the chair. The fingers on the left hand should be employed in holding the lips out of the way, and to give a view of what is to be done. The file should be held between the thumb and middle finger of the right hand, with the index finger resting on its edge. The file should be moved backward and forward with a gentle crushing of the enamel, as it cuts a way for itself, pressing it more forcibly on the tooth which is decayed, (when only one happens to be decayed). It is better, always, to begin with a thin file, and gradually to increase the thickness, than to use a thick file from the first; and it is always the rule to use a flat file first, and then to finish the shoulder which the flat file leaves, with a file having a half round or roundish edge.

Q. How should you use a chisel for the removal of decay from the front teeth?

A. The position of the operator is much the same as that already described. The head of the patient should be thrown back by lowering the head-rest so as to expose to clear view the palatal surfaces of the teeth. The teeth to be operated on should be steadied and held firmly by the fingers of the left hand, the chisels, or hard bits, should be held in the right hand, close to the cutting points, and the enamel abraided and cut away so as to remove the superficial decay, or to prepare the surface, should the decay be deep seated and require

a filling; this to prevent the instruments from slipping, and to avoid as much as possible the disfigurement in the shape of the tooth from its labial aspect.

Q. How are the bicuspids and molars best separated?

A. With a file. A file having a shape like the letter V is best. But the part of the tooth near the gum should have a distinct shoulder and this shoulder nicely rounded. If the filing is not conducted thus, the filed surfaces will approach each other, and it would have been better to have done nothing than to file in this way. The separation should represent two V's. One with the inside part towards the masticating surfaces of the teeth and the other towards the palatal surface, so as to afford the ready cleansing of the filed surfaces by means of quill toothpick, dental floss or the rinsing of the mouth with water.

CORRESPONDENCE.

T. F. Chupein, 1408 Pine St., Philadelphia, Pa.

Dear Doctor:—The following communications was received from President Bonney, of the World's Congress Auxiliary which, necessitates a change in the time of meeting, and also a re-arrangement of the order of business for the World's Columbian Dental Congress.

"The Dental Congress has been assigned generally to the week commencing Monday, August 14th, 1893. The Congress of Science and Philosophy have been assigned to the week commencing Monday, August 21st, 1893. With more than a hundred congresses to provide for, you will readily understand the extraordinary difficulty of making suitable arrangements for each, but the extra provision which has been made for the places of meeting will render practicable arrangements which, under the circumstances would be simply impossible. When the Congresses were first proposed we expected to have only one large audience room with a suitable number of smaller halls; but as the World's Congress work enlarged the places of meeting were also made more adequate. As the World's Congress Art Palace is now planned there will be two large audience rooms capable of accommodating three thousand persons each, and more than twenty smaller halls, which will seat from three hundred to seven hundred persons each. Thus providing for no less than thirty six large meetings in a single week, by holding morning, afternoon and evening sessions. Among the other Congresses assigned to be held in parallel with the Dental Congress, are those of Pharmacy, Medical Jurisprudence and Horticulture. For all these the accommodations will be adequate. You understand, of course, that everything in the

nature of an Exhibit is required by the Exposition Authorities to go to Jackson Park. The Congresses deal not with things, but with men, not with matter, but with mind."

In accordance with the above statement the time of meeting will be from Monday August 14th, to Saturday, August 19th inclusive.

Please note this change in your Journal.

Yours very truly, A. O. HUNT, Per L.

CONSTITUTION OF THE GENERAL EXECUTIVE COMMITTEE OF THE WORLD'S COLUMBIAN DENTAL CONGRESS.

NAME.

ART. I. The World's Combination Dental Congress.

PLACE OF MEETING.

ART. II. Chicago, Illinois

TIME OF MEETING.

ART. III. Monday, August 17th, 1893, continuing till Aug. 27th, inclusive.

OBJECTS.

ART. IV. The bringing together for professional, scientific and social purposes the dentists of the United States and all other countries.

OFFICERS.

ART. V. The officers shall be a President, four Vice-Presidents, Secretary-General and two Assistant-Secretaries (to be selected with reference to linguistic attainments), and a Treasurer.

MEETING OF COMMITTEE.

ART. VI. The General Executive Committee shall hold its meetings for the transaction of such business at such times and places as they may elect from time to time.

DUTY OF THE COMMITTEE.

ART. VII. It shall be the duty of the chairman of this Committee to preside at all meetings of the committee, and to carry out any matters put in his charge by the General Committee. He shall have power, upon consulting with three members of this committee, to call a meeting, when in his judgment it may be necessary.

DUTY OF THE SECRETARY.

ART. VIII. The duty of the secretary of this committee shall be to keep a record of all proceedings; to receive and put in proper form, for the use of this committee, a synopsis of the work accomplished, from time to time, by each of the special committees.

DUTY OF THE TREASURER.

ART. IX. It shall be the duty of the Treasurer to receive and have in charge all moneys for or belonging to the "World's Columbian Dental Congress," and to pay out the same on the order of the chairman and the Secretary of this committee, all bills having been passed upon by the auditing committee.

THE POWER OF THE COMMITTEE.

ART. X. The General Committee shall have and exercise supreme control and direction in all matters pertaining to the organization and work in 1893.

PROXIES.

ART. XI. At any and all meetings of this committee, any absentee is requested to send his proxy, authorizing any member he may select to act for him in his absence; he may instruct or not as he may choose.

QUORUM.

ART. XII. Eight members, five of whom must be present in person, and with at least three proxies, with instructions, will be required to constitute a quorum for business.

AMENDMENTS.

ART. XIII. These rules and regulations may be amended at any regular meeting of this committee, upon a vote of two-thirds of the General Committee.

SPECIAL COMMITTEES.

1. General Finance Committee to consist of three members.
2. Programme Committee to consist of five members.
3. Committee on Exhibits, to consist of three members.
4. Committee on Transportation, to consist of three members.
5. Committee on Reception, to consist of fifteen members.
6. Committee on Registration, to consist of seven members.
7. Committee on Printing Transactions, to consist of three members, of which the secretary-general shall be chairman.
8. Committee on Conference with State and Local Societies, with a view of eliciting their interest and co-operation.
9. Committee on the history of Dental Legislation in this and other countries.
10. Auditing Committee, to consist of three persons, of which the Chairman of the Finance Committee shall be one.
11. Committee on Invitation, to consist of five members.
12. Committee on Membership, to consist of five members.
13. Committee on Educational and Literary Exhibit, to consist of five members.
14. Committee of Clinics in Operative Dentistry and Oral Surgery, to consist of five members.
15. Committee of Prosthetic Dentistry, to consist of five members.

On motion the report of the committee was adopted as a whole.

On motion it was resolved that a committee of three, of which Dr. Walker shall be chairman, be appointed to nominate the persons for the special committees named in the report.

W. W. Walker, A. W. Harlan, J. C. Storey, committee.

REPORT OF NOMINATING COMMITTEE.

[Names marked * have declined appointment.]

COMMITTEE ON CONFERENCE.

C. N. Pierce, 1415 Walnut street, Philadelphia, Pa.; A. Warner, Jr. 224 Kearney street, San Francisco, Cal.; George H. Cushing, 96

State street, Chicago Ill.; J. N. Crouse, 2231 Prairie Avenue Chicago, Ill.; W. Herbst, Schillestrasse 31, Bremen, Germany; Wm. Jarvie, 105 Clinton street, Brooklyn, N. Y.; R. E. Watkins, Eutaw, Alabama; S. B. Brown, 15 and 16 Bank Block, Ft. Wayne, Ind; S. A. Main, 666 Fifth ave., New York City, N. Y.; H. A. Smith, 128 Garfield Place, Cincinnati, Ohio; C. R. Butler, 519 Euclid ave., Cleveland, Ohio; Chas. J. Essig, 1700 Locust street, Philadelphia, Pa.; James Truman, 3243 Chestnut street, Philadelphia, Pa.; Garrett Newkirk, 34 Monroe street, Chicago, Ill.; A. R. Eaton, 114 E. Jersey street, Elizabeth, N. J.; W. J. Younger, 300 Stockton street, San Francisco, Cal.; H. M. Hunter, San Antonio, Texas; W. R. Patton, Gereonstrasse 34, Cologne, Germany; F. H Balkwill, 3 Princess Square, Plymouth, England; R. T. Stack, 10 Westland Row, Dublin, Ireland; W. B. Pearsall, 13 Upper Merrion street, Dublin, Ireland; W. B. Pearsall, 13 Upper Merrion street, Dublin, Ireland; * J. Smith Turner, 12 George street, Hanover Square, London, England; Henry Sewill, 40 Wimpole street, London, W., England; B. A Muckenfuss, 364 King street, Charlestown, S. C.; W. E. Magill, 932 Pearl street, Erie, Pa.; C. C. Chittenden, 21 West Main street, Madison, Wis.; Frank Abbott, 22 W. 40th street, New York City, N. Y.; C. E. Francis. 33 W. 19th street, N. Y. City, N. Y.; J. L. Williams, 1 Mt. Vernon street. Boston, Mass.; E A. Bogue, 29 E. 20th street, New York City, N. Y.; P. G. C. Hunt, 143 N. Penn street, Indianapolis, Ind.; J. E Cravens, 46½ E. Ohio street, Indianapolis, Ind.; E. H. Angle, 13 Syndicate Block, Minneapolis, Minn.; Ludwig Hollander, Markt 14, Halle, Germany; W. Campbell, 27 South Tay street, Dundee, Scotland; S. B. Cook, Chattanooga, Tenn.; W. T. Arrington, Memphis, Tenn.; B. G. Maerklein, 62 Wisconsin street, Milwaukee, Wis.; A. W. Nason, Corner 15th and Harney streets, Omaha, Neb.; S. J. Barber, Portland, Oregon; C. S. Case, Jackson, Mich.; L. C. Ingersoll, Keokuk, Iowa; Wm. Taft, 122 W. 7th street, Cincinnati, Ohio; J. Hayhurst, Lambertville, N. J.; * Corydon Palmer, Warren, Ohio; A. O. Rawls, Lexington, Ky., J. N. Farrar, 1271 Broadway, New York City, N. Y.; E. T. Darby, 1513 Walnut street, Philadelphia, Pa.; G. S. Rembert, Natchez, Miss.; Louis Augspath, Little Rock, Ark.; W. G. A. Bonwill, 2009 Chestnut street, Philadelphia, Pa.; T. B. Welch, Vineland, N. J.; Geo. Watt, Xenia, Ohio.

COMMITTEE No. 2.

C. N. Johnson, *Chairman*, 612 Opera House Building, Chicago, Ill.; J. A Dunn, 70 Dearborn street, Chicago, Ill.; Geo. Eubank, Birmingham, Ala.; J. W. Wassall, 208 Dearborn ave., Chicago, Ill.; Geo. Hardy, 716 Park ave, Baltimore, Md.: Louis Ottofy, Masonic Temple, Chicago, Ill.; L. P. Bethel, Kent, Ohio.

COMMITTEE No. 3.

M. L. Rhein, 104 E. 58th street, New York City, N. Y.; A. W. McCandless, 1001 Masonic Temple, Chicago, Ill.; R. C. Young, Anniston, Ala.; James Chace, Ocala, Fla.

COMMITTEE No. 4.

John E. Storey, Dallas, Texas; H. A. Fynn, Denver, Col.

COMMITTEE No. 5.

J. A. Swasey, *Chairman*, 3017 Michigan ave., Chicago, Ill ; * C. D. Cook, 133 Pacific street, Brooklyn, N. Y. ; E. D. Swain, 65 Randolph street, Chicago, Ill. ; M. V. Toledo, New York City, N. Y. ; A. E. Baldwin, Chicago, Ill. ; A. F. Emminger, Columbus, Ohio ; T. L. Gilmer, 55 Thirty-third street, Chicago, Ill. ; H. J. Burkhardt, Batavia, N. Y. ; F. N. Browne, Abilene, Texas ; * Geo. J. Friedrichs, New Orleans, La. ; J. W. Taylor, New York City, New York ; Geo. L. Field, Abstract Building, Detroit, Mich. ; F. E. Howard, Buffalo, N. Y. ; A. H. Fuller, 2602 Locust street, St. Louis, Mo. ; H. W. Shriver, Barker Block, Omaha, Neb. ; R. K. Luckie, Holly Springs, Miss. ; C. S. Searles, Dubuque, Iowa ; L. D. Shephard, Boston, Mass.

COMMITTEE No. 6.

W. W. Hill, Washington, Ga. ; Chas. L. Dubar, 451 W. 22d street, N. Y. City, N. Y. ; S. W. Foster, Decatur, Ala. ; H. N. Young, Wilkesbarre, Pa.

COMMITTEE No. 8.

S. A. Mulkey, *Chairman*, Moscow, Idaho ; * Chas. Ekhart, New Orleans, La. ; Chas. A. Meeker, 29 Fulton street, Newark, N. J. ; J. R. Callahan, Cincinnati, Ohio ; J. R. Cardwell, Portland, Oregon ; Geo. H. Ames, Providence, R. I. ; L. D. Shepard, 330 Dartmouth street, Boston, Mass. ; Geo A. Maxfield, 390 High street, Holyoke, Mass. ; James H. Daly, 29 Hollis street, Boston Mass.

COMMITTEE No. 9.

C. Stoddard Smith, 34 Washington street, Chicago, Ill. ; S. R. Salazar, Lima, Peru ; * John H. Coyle, Thomasville, Ga. ; W. F. Rehfuss, 1224 Walnut street, Philadelphia, Pa. ; Theo. Frisch, Obere Zaune, 10, Zurich, Switzerland.

COMMITTEE No. 11.

Thos. Fillebrown, 264 Boylston street, Boston, Mass. ; Thos. T. Moore, Columbia, S. C. ; Geo. B. Steel, 723 Main street, Richmond, Va.

COMMITTEE No. 12.

E. L. Townsend, Los Angeles, Cal. ; C. E. Hussey, Biddeford, Me ;

COMMITTEE No. 13.

D. M. Sabater, 107 E. 30th street, New York City, N. Y.

COMMITTEE No. 14.

J. S. Marshall, *Vice-Chairman*, Venetian Building, Chicago, Ill. ; T. L. Gilmer, 34 Washington street, Chicago, Ill. ; S. C. G. Watkins, Mt. Clair, N. J. ; M. C. Gottschaldt, 102 E. 31st street, New York City, N. Y.; R. Heide, 3 Rue d'Argenteul, Paris, France ; * R. Schreiter, Annestrasse 26, Chemnitz, Germany ; J. G. Reid, 70 Dearborn street, Chicago, Ill. ; B. D. Wikoff, 1000 Masonic Temple, Chicago, Ill. ; F. T. Breene, Iowa City, Iowa ; N. S. Hoff, Ann Arbor, Mich ; J. H. Gaskill, 1313 Arch street, Philadelphia, Pa. ; J. M. Norman, 1126 15th street, Denver, Col.

COMMITTEE No. 15.

Harry Rose, 59 Queen Anne street, Cavendish Square, London, England ; F. H. Balkwill, 3 Princess Square, Plymouth, England ;

J. R. Knapp, New Orleans, La.; C. M. Richmond, 70 W. 35th street; New York City, N. Y.; W. B. Ames, 70 State street, Chicago, Ill., G. Molyneaux, Cor. 7th and Elm streets, Cincinnati, O.; C. V; Rosser, Atlanta, Ga; John S. Thompson. Atlanta, Ga.; F. M. Shriver, Glenwood, Iowa.

COMMITTEE No. 17.

C. N. Pierce, 1415 Walnut street, Philadelphia, Pa.

COMMITTEE No. 18.

J. Hayhurst, Lambertville, N. J.

COMMITTEE No. 19.

G. V. Black, *Chairman*, Jacksonville, Ill.; E. C. Kirk, Corner 12th and Chestnut streets, Philadelphia, Pa.; W. O. Kulp, Masonic Temple, Davenport, Iowa; J. Edwin Line, 20 Smith's Arcade, Rochester, N. Y.; J. B. Hodgkin, N. Y. ave., N. W., Washington, D. C.; J. S. Cassidy, Covington, Ky.; C. T. Stockwell, Corner Main street and Harrison avenue, Springfield, Mass.; A. Witzel, Hochstrasse 1, Essen, Germany; E. Richter, Chaussestrasse 1. a N. Berlin, Germany; J. V. Metnitz, Am. Hoff 11, Vienna, Austria; O. Rosenthal, Leige, Belgium; P. Sidney Spokes, 59 Queen Anne street, Cavendish Square, London, W., Eng.

COMMITTEE No. 20.

Frank Wooodbury, 137 Hollis street, Halifax, N. Scotia; Thos. Gaddes, London, England.

COMMITTEE No. 21.

T. H. Parramore, *Chairman*, Hampton, Va.; M. V. Johnson, Holden, Mo.; J. Allen, Osmun, Newark, N. J.; C. S. Butler, 272 Main street, Buffalo, N. Y.; Corydon Palmer, Warren, Ohio.

COMMITTEE No. 22.

G. V. Black, Jacksonville, Ill.

COMMITTEE No. 23.

E. P. Keech, 525 N. Charles street, Baltimore, Md.; Otto Arnold, 83 N. High street, Columbus, Ohio; C. B. Rohland, 123 West Third street, Alton, Ill.

COMMITTEE. No. 24.

A. W. Harlan, Masonic Temple, Chicago, Ill.

SUB-COMMITTEE.

A. W. Harlan, Masonic Temple Chicago, Ill.; A. O. Hunt, Iowa City, Iowa; John S. Marshall, Venetian Building, Chicago, Ill.

A. O. Hunt, *Secretary.*

ORDER OF BUSINESS.

August 17th, Thursday.—10 a. m., Meeting of the General Executive Committee. 11 a. m., Opening of the Congress. Reading of the Resolutions creating the Congress by the Secretary General. Address of welcome by John Temple Graves, of Georgia. Responses. Responses from foreign countries. Address of the President. Adjournment. 2.30 p. m., Papers to be read in the sections. 5 p. m., Adjournment.

August 18th, Friday.—9 a. m., Clinics. 10 a. m., Meeting of the General Executive Committee. 12 m., Address before the whole Congress. 1 p. m., Adjournment. 2.30 p. m., Papers to be read in sections. 5. p. m., Adjournment. 8 p. m. Bacteriological exhibit.

August 19th, Saturday.—9 a. m., Clinics. 10 a. m, Meeting of the General Executive Committee. 12 m., Address before the whole Congress. 1 p. m., Adjournment. 2 30 p. m., Garden party. 2.30 p. m., Garden party. 2.30 p. m., Garden party. 8. p. m., Conversazione. 8 p. m., Conversazione. 8 p. m., Conversazione.

August 21st, Monday.—9. a.m., Clinics. 10 a. m., Meeting of the General Executive Committe. 12 m., General address before the whole Congress. 1 p. m., Adjournment. 2.30 p. m., Papers before the Sections. 8 p. m., Biology. Lantern Exhibition.

August 22, Tuesday.—9 a. m., Clinics. 10 a. m., Meeting of the General Executive Committee. 12 m., General address before the whole Congress. 1 p. m., Adjournment. 2.30 p. m., Papers before the Sections. 8 p. m., Bacteriological and Biological Exhibit. 8 p. m., Conversazione. 8 p. m., Conversazione. 8 p. m., Conversazione.

August 23rd, Wednesday.—9 a. m., Clinics. 10 a. m, Meeting of the General Executive Committee. 12 m., Address before the whole Congress. 1 p. m., Adjournment. 2.30 p. m., Papers to be read before the Sections. 8 p. m, Public address under direction of World's Congress Auxiliary.

August 24th, Thursday.—9 a. m., Clinics at Hospitals. Clinics at the Art Institute. 10 a. m., Meeting of the General Executive Committee. 12 m., General address before the whole Congress. 2.30 p. m., Papers to read in Sections. 8 p. m., Dinner to the whole Congress. (Subscriptions by members from the United States only).

August 25th, Friday.—10 a. m., Visit in a body to the Medical and Dental Exhibits at the World's Fair Grounds. 12 m., Closing Addresses to the Congress. Luncheon by the members in the Restaurant. (Name to be supplied.)

Report of Committee on Foreign Honorary Officers.

Great Britain.—*Honorary President*—J H Mummery, L D S, M R C S, Eng., 10 Cavendish Place, London, W., Eng. *Honorary Vice Presidents*—William Herbert Woodruff, L D S 13 New Burlington street, London, W., Eng.; W B Macleod, L D S, 16 George Square, Edinburgh, Scotland; W B Pearsall, F R C S, Ireland, 13 Upper Merrion street, Dublin, Ireland; F H Balkwill, L D.S., 3 Princess Square, Plymouth, Eng. *Honorary Secretary*—Geo. Cunningham, L. D. S., 2 King's Parade, Cambridge, Eng.

Canada.—*Honorary President*—W Geo. Beers, 47 Union ave., Montreal, Canada. *Honorary Vice Presidents*—A C Cogswell, D D.S., Halifax, Nova Scotia; Dr. J B Willmott, Toronto, Canada. *Honorary Secretary*—Dr. R H Robertson, Portage La Prairie, Manitoba.

Holland.—*Honorary President*—John E. Grevers, Oude Turf-

markt, 13, Amsterdam, Holland. *Honorary Vice-Presidents*—A C J Koenaart, Hoogstrasse 219, Rotterdam, Holland; Dr. Theo. Dentz, Kromme Nieuwegracht 31, Lector, Utrecht, Holland.

GERMANY.—*Honorary President*—Dr. Robert Carl Franz, Baume, Oranienburgerstrasse, 58, N. Berlin, Ger. *Honorary Vice-Presidents*—Dr. Ludwig Hollander, Markt, 14, Halle, Germany; F W Herbst, D. D. S., Schillerstrasse 31, Bremen, Germany; Julius Parreiat, Windmuhlenstrasse, Leipsig, Germany; Wilhelm Sachs, D.D.S., Museumsplatz 7, Breslau, Germany; Dr. F Hesse, Goethestrasse 5, Leipsig. Ger.; Dr. Adolph Witzel, Hochstrasse 1, Essen, Germany. *Honorary Secretary*—Prof. Ludwig Warnekros, Unter den Linden 30, W. Berlin, Germany.

BELGIUM.—*Honorary President*—H Bon 34 Rue de la loi, Brussels, Belgium. *Honorary Vice-Presidents*—J Verschuren, Can Recollets 41, Antwerp, Belgium; J Binge, Rue Casquette 51, Leige, Belgium; L C Depaepe, Place Station 14, Louvain, Belgium; Hect Minne, Rue Quellin 25, Antwerp, Belgium; Dr. J F Pourveur, Rue Tanneurs, 42 Antwerp, Belgium. *Honorary Secretary*—Dr. Von Blairen, Brussels, Belgium.

FRANCE.—*Honorary President*—Dr. E Lecaudey, Boulevard Haussman, Paris, France. *Honorary Vice-Presidents*—V Anjubault, 66 Rue de Provence, Paris France; Henry Crignier, 27 Rue Taitbout, Paris, France; M F Touchard, 57 Rue Rochechouart, Paris, France; Charles Godon, 72 Boulevard Haussman, Paris, France; Dr. V Gallipe, 3 Rue de L'abbaye, Paris, France. *Honorary Secretary*—F Ducournau, 6 Rue Gaillon, Paris, France.

SWITZERLAND—*Honorary President*—C O Schulthess, D. D. S., 24 Schutzengraben, Basel, Switzerland. *Honorary Vice-Presidents*—P A Kolliker, Obere Zaune 10, Zurich, Switzerland; Louis Roussy, 8 Rue St. Leger, Geneva, Switzerland; *Honorary Secretary*—Paul Witzig, L.D.S., 17 Schlusselberg, Basle, Switzerland.

AUSTRO-HUNGARY.—*Honorary President*—Dr. H. Schmid, 3 Jungmannsplatz, Prague; *Honorary Vice-Presidents*—Dr. Joseph Iszlai, Deak Ferenza uteza 4, Budapest, Hungary; Dr. Julius Scheff, Jr., Hoher Markt 4, Vienna, Austria; Dr. Carl Fischer-Colbric, Kohlmark, 11, Vienna, Austria; Dr. Anton Bleichsteiner, Herrengasse 28, Gratz; Dr. W Vajna, Innere Monastergasse, 2 Klausenburg, in Siebenburgen, Hungary. *Honorary Secretary*—Dr. Anton Papsch, Museumstrasse 20, Innspruck, Austria.

ROUMANIA.—*Honorary President*—Dr. L Goldberge, Rue Domenica Pailas. A., Wwe, Galatz. *Honorary Vice Presidents*—Dr. Lempart, Bucharest, Roumania; Dr. P Macarowic, Armeanostrasse, Jassy; M End, Bucharest, Roumania.

SPAIN.—*Honorary President*—Francisco Carbonell, Rambla de San Jose, 22, Barcelona, Spain. *Honorary Vice-Presidents*—Dr. Pirso Perez, Dentisto, Mayor, 73, Madrid, Spain; M. Trallero, Barcelona, Spain; A Trivino, 29 Calla de la Montera, Madrid, Spain; Dr. R H Portuondo, Infantas, 28-30, Madrid; Y. de Otaola, 51 Som-

era. Bilboa. Spain. *Honorary Secretary*—Dr. Florestan Aguilar, San Jose, No. 2, Cadiz, Spain

PORTUGAL.—*Honorary President*—Y P G Pavia, Travessa Assumpcao 103, Lisbon, Portugal. *Honorary Vice-Presidents*—Carl Koth, Lisbon, Portugal; Da Silva, 26 Plaza de dom Pedro, Porto, Portugal.

ITALY.—*Honorary President*—Cesare Campani, Sig. Cav. Dott., Piazza delle Signori 5, Florence, Italy. *Honorary Vice-Presidents*—Pietro Ribolla, Sig., Dela Reale Casa, Rome, Italy; Sig. Cav. Dott Francisco Garelli, Via Rome, 15 Turin, Italy; Carlo Platschich, Via Bassano Porrone 8, Milano, Italy; Antonio Damiano Mela, Salita Santa Canterino I., Genoa, Italy; Dr. Luigi Ribolla Nicodemi, Palermo, Italy. *Honorary Secretary*—Prof. Guiseppe Cali, Neapel Strada Taverna Penta 33, Rome, Italy.

GREECE — *Honorary President* — D Caracatsanis, Minerva lol, Athens, Greece. *Honorary Vice-President*—J Neumann, Rue Kidalhinias 3, Athens, Greece. *Honorary Secretary*—To be selected by the President.

BULGARIA.—*Honorary President*—I A Muszler, in Sofia, Bulgaria.

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NITROUS OXIDE AND ANÆSTHESIA.

Read before the Muscatine Academy of Science, by Dr. J. Hardman, D.D.S., Member of State Dental Examining Board.

Anæsthesia means in its general application a state of insensibility induced by any agent that will obtund pain. But in practice, its usual application has reference to a state of insensibility induced by the constitutional administration of some substance in a gaseous condition. However, to this definition may be mentioned that the term is also used to denote a partial, or local, paralysis induced by

various agents that, being applied locally, may, or may not be, when used in a gaseous state.

The use of agents for the purpose of inducing insensibility is of very remote date. Man, like all animals beneath him, is so organized that sensation may be said to pervade his entire organism. Scarcely the point of the finest needle can enter a muscular or secretory tissue of the whole body but that it will come in contact with some nerve fasciculi or fibers forming the periphery of the nervous system, and like a constant monitor to the sensorium, warns with lightning speed of the intruding presence. Without this sense of touch, man's very existence would be placed in jeopardy—a wreckless and sure destruction would drive his race toward a rapid end.

It follows then that pain, the unpleasant feature of sensation, is indeed a blessing ; as it in many ways and times administers to man's physical wants from his very birth to his final demise. But as pain is always unpleasant, and at all times has been destructive to man's immediate happiness, man has at all times and in all ages shown a desire to avoid being hurt. The use of agents for the purpose of obtunding sensibility is of ancient date. Probably the first account given in written history is that celebrated one when Adam was said to have fallen under a " deep sleep," and thus prepared to undergo the chirurgie that was to bless the bachelor world with the advent of the very first woman that sang a " hush-a-by " to a coming and restless race. But, as Adam's biographer leaves us in the dark as to many important features of this important anæsthesia, we are left to speculate as to how rapidly he sank under its influence, what his warning sensations were, how profoundly he slept and how securely from pain, and finally, what were his sensations during recovery. All we know from the account is it must have been painless and presumed to be an evidence, at least, that the writer knew of the benefit anæsthesia in extensive surgical operation.

As pain means suffering, it is reasonable that means would be sought after to favor an escape from its realization. Hence. in more primitive times, crude mechanical devices to cut off sensation by means of hard pressure by the use of the actual-cauter, by stunning blows, &c.

About the first intelligent effort to use a therapeutic agent for anæsthesia came from the discovery of nitrous-oxide by Priestley in 1776. Sir Humphrey Davy first noticed its exhilirating and anæsthetic properties in 1800. From this time to 1844 it was employed almost exclusively for purposes of diversion by exhibitionists and chemists under the appellation of laughing-gas.

In December of 1844, Dr. Horace Wells, a dentist, of Hartford-Conn., having witnessed its effects at a chemical lecture entertain, ment one evening, was inspired with its very probable usefulness as a pain-destroyer in dental operations. So the next day he took the gas himself, and had, while under its influence, a tooth extracted. The Doctor, on recovery, exclaimed, "A new era in tooth pulling!" And this proved somewhat prophetic. As no pain was felt by the Doctor himself in this test upon his own person, he lost no opportunity in his practice to fully prove its usefulness and reliability as an anæsthetic; while others in dentistry and also some in surgery, adopted its use with very satisfactory results.

The introduction of sul. ether and of chloroform for anæsthetic purposes, very soon after the discovery of Dr. Wells, with their superior convenient form for immediate use, compared with the then very difficult and tedious mode of preparing the nitrous oxide gas, was a very effective reason for their more ready acceptability by especially the general surgeon. But in the course of time, as chloroform and ether (especially the former) were attended with numerous fatal results, the use of nitrous oxide gas again began to grow in favor, and, within the last ten or fifteen years it has greatly taken the place of all other anæsthetic agents in dentistry, while in surgery many are using nothing else.

A few reasons for the late growing favor of the use of this gas may be cited. One is, its well established safety to life. Another is the convenience in its exhibition by the use of the much improved apparatus for that purpose. And still another is its pleasant taste and sensation; and finally its speedy and effectual subsidence.

While the path of chloroform is marked by many sad fatalities, and that of sul. ether, though much safer, but nevertheless proven in too many cases unsafe; nitrous oxide anæsthesia has been attended by but very few accidents, although many thousands are taking it every year. The few fatal cases that have occurred were in the hands of parties who prepared (hastily no doubt) their own gas, and by overheating, or otherwise, produced, combined with it, more or less nitric oxide or poisonous acids and the ill effects can fairly be imputed to this cause, which, however, no longer attends, as the system of preparation now in vogue effectually forbids anything but the pure, unadulterated nitrous oxide.

It has been maintained by some that all these agents producing general insensibility, do so by acting upon the sanguinous fluid; that, especially the red corpuscles of the blood are so affected that their

form and structure actually show it. This is denied by other micro scopists so far as any structural damage can be found; but, at all events, the blood furnishing the vehicle for these agents, must deviate from normality. And, as natural respiration is for the time quiet, or mainly cut off, it must follow that a radical increase of some, and a loss of other essential elements must take place—less than normal of oxygen, and more than normal of carbon, must prevail to an extent commensurate to the completeness of non atmospheric respiration, and length of anæsthetic period.

It is well known that man cannot long survive under complete arrest of atmospheric respiration. That if the usual functions of all the organs is maintained, so much carbonic impurities would accumulate as to endanger life by inducing fatal asphyxia. If this condition is accepted as a main cause of danger in anæsthesia, then it must be, that the usual rate of carbon is not evolved owing to partial or entire suspension of organic action in narcosis; or else, especially in protracted cases, death would invariably be the result.

In necroscopy, it is found the brain, in fatal narcosis, is almost invariably blanched and bloodless, and that the heart, large blood-vessels and the lungs are engorged with dark blood, no matter what agent has been used. This proves one general condition attending all cases of fatality of this kind, viz : extreme syncope; and no doubt induced through a paralyzation of the sympathetic system of nerves; thus arresting the action of the heart, and it failing to force the blood, (the natural nerve stimulant) upon the brain, the fainting is made permanent.

That the modus-operanda of each agent is attended with varied relative degrees of attending danger, there is no doubt; as each or at least some of the agents become to a greater or lesser degree decomposed and thus set elements free that in themselves may be toxic to the system. Thus, in chloroform being acted upon in the system, may give off pure chlorine—a poison itself. And upon this same course of reasoning, it has been claimed that nitrous oxide has its superior safety in prolonged anæsthesia, as there is no toxic agent eliminated upon its decomposition, should that take place, nitrogen being harmless; and oxygen, a requisite for the maintenance of life.

While this is true in regard to these two elements of this gas, being non-poisonous, it, however, cannot be claimed that though it differs but little in its constituent elements from that of pure air, it nevertheless will *not* sustain respiration.

This gas (N 2 O.) nitrogen two, oxygen one, does seem to compare

favorably with atmosphere, (N 4 O.) Nitrogen four, oxygen one, for the purpose of respiration. But upon a little reflection, it becomes evident that for respiratory purposes there is a great difference in their applicability. Oxygen is the element needed as the great scavenger to dissolve and remove effete and waste material from the body. But it cannot be respired alone, and it must not be locked in a chemical combination with any other element; hence, nature furnishes it in a great abundance simply in a state of mechanical mixture with nitrogen. This is its condition as we breathe it. Nitrogen is not appropriated in respiration, but seem to form the needed diluent for oxygen, and yet holding no undue restraint upon it. Not so with nitrous oxide; while it consists of the same elements, slightly differing quantitatively, it is a chemical compound. This is evidenced from its having an odor and a taste. This combination in N 2 O. is so intense that when inspired it meets no agent presenting inducement for it to break its relationship for that of any other; hence, it traverses the system keeping the coveted agent, oxygen, locked in its embrace from beginning of its tour to the end thereof, simply as nitrous oxide. It follows then that it most likely does not become decomposed; it engenders no poisonous agent. If it really decomposes while in the system, neither element eliminated, in itself is toxical or materially harmful.

There are three stages in anæsthesia that deserve consideration.

1st. That of exhiliration or excitement. where, in the commencement, the activities of the body are increased, as shown by an increased pulse and sensations generally. This is more marked in chloroform, sul. ether or ethel bromide than in nitrous oxide.

2nd. Narcotism or true anæsthesia. In this stage the pupil of the eye dilates, the subject is unable to raise his hand, and if it be raised it drops limpid to his side. If the finger is placed upon the eyeball it fails to excite any sensation. This is the true operative stage.

3d. That of asphyxia. This being added to the foregoing stages, is marked by a purpleness of the lips, face, hands, &c., and a chokey, and even may be, stertorous breathing.

This third stage is the stage of danger, so that when the second stage is established the agent is at once withheld. It is seldom if ever that nitrous oxide gas induces this last and undesirable stage. Hence the plain reason that it is regarded as much the safest of all agents in anæsthesia.

As we are considering nitrous oxide specially, it may be quite proper to say something of its manufacture. This gas, as a protoxide or

nitrogen, consists of 14 parts, by weight, of nitrogen, and 8 parts of oxygen. It is, as we have stated, a combination of elements, and not a mere mixture of them, as is the fact in that of the air we breathe. It is a colorless gas, with a sweetish taste and smell; although the constituent elements alone and separate have neither taste or odor. It is prepared by heating pure nitrate of ammonia to about 390 degrees Far. in a glass retort, which evolves the gas; that being forced through vessels containing water and some purifying chemicals, it is finally stored iu a receiver. A few years ago each operator was compelled to manufacture the gas as he needed it; and much difficulty attended the making and retaining it in a state of purity. Not so now. Special adepts, with well constructed apparatus, manufacture it for the profession upon an extended scale in many of the principal cities of the country, and they compress it into a liquid form by machinery and securely pack it into strong iron cylinders which safely keep it in a pure state for any length of time, and in good shape for handling, transportation, &c. The operator merely with a wrench sets as much free as is needed at the time, and when this cylinder is exhausted, sends it to headquarters by express, and by return he receives it full and again ready for use.

Formerly, too, the filthy and injurious mode of administration, was for a patient to breathe it from a rubber bag and blow his breath back into the same receptacle, thus mixing the impurities of his respirations with the gas, and in many cases this impure and offensive compound was, shameful to say, presented to a second and even to a third party. Not so now; the same gas is never allowed to be re-inspired. An elegant mouth-piece, so prepared with suitable valves, that while the gas can be readily drawn by inspiration from the rubber bag, on expiring not a particle can be forced back into it—the patient obtaining nothing but pure gas and air, and perfectly free from anything disgusting from former patients' respirations.

Just what produces anæsthesia has been and still remains a question of dispute. That each agent has more or less direct narcotic effect, there seems no doubt, but it is also very certain that no insignificant influence prevails, arising from the check on, or arrest of, respiration. As during the entire induction period; as most operators use it but little, if any air is inspired, more or less effect must follow from cutting off the needed amount of oxygen, and the evident increase of carbonic acid. And that this latter gas does induce stupor and even profound insensibility there is the best of evidence. Parties exposed to its influence (fire damp) in wells, in mines, or in sleeping chambers

where fuel combustion was going on while the flue damper of the exhaust pipe of burner closed, and thus forcing the carbonic acid to remain in the room, to gradually steal away the sensibility of the sleepers, and, if prolonged, their very lives. This well known effect of carbon bioxide to stupify the breather in these cases mentioned, and the certain fact that much of this agent must attend in anæsthetic efforts, go to furnish quite strong evidence that this is most likely the principal factor, and that asphyxia is synonymous with anæsthesia. The question then is of special interest: Will carbonic acid produce anæsthesia? We believe it will, and that it is the principal factor in each and every case where either of the ordinary agents are used that furnishes the profound unconsciousness in narcosis, and in nine cases out of ten, where physical injury is done, it arises from this cause. When this is not so and injury is not the result of organic malformation, or structural lesion, then if occurring in the first or second stage, it most likely is the result of toxic elements set free, as chlorine and carbon for instance, from chloroform.

To recapitulate the principal points:

1st. Anæsthesia is of ancient date.

2nd. Its practical and intelligent application to subserve the wants of man was a discovery of Dr. H. Wells, a dentist.

3d. The principal agents used are nitrous oxide, sul. ether, chloroform and ethel bromide, and their relative safety is severally, as here mentioned.

4th. That in the use of nitrous oxide gas, no poisonous element from the agent is evolved.

5th. That in a large majority of cases in profound anæsthesia the principal active agent is carbonic acid.

6th. Therefore for general anæsthesia use nitrous oxide gas, not surpassing the limit of the second stage of narcosis.

RUBBER AND THE PROCESS OF VULCANIZING.

By Dr. W. C. Barrett.

The dried product of the rubber tree consists of caoutchouc, with a little albumen and nitrogenous matter, and unless the former is freed from the two latter ingredients the quality of rubber gum may be injured by their decomposition. The caoutchouc is held in suspension in the watery fluid, that exudes from the tree, by ammonia, and so forms a vegetable emulsion; when exposed to air the ammonia is given off, the caoutchouc coagulates and the water evaporates, whilst the other ingredients are held within the inspissated mass. Coagula

tion may also be induced by the addition of an acid, or a saline fluid, alum or salt water being commonly employed. If ammonia be added to it, coagulation is prevented. If salt water be added, the gum is injured by being made very hygroscopic, or capable of absorbing a considerable quantity of water.

Pure caoutchouc is a hydro-carbon, it being composed of carbon and hydrogen exclusively, in about the proportions of 87.5 per cent. of the former, to 12.5 per cent. of the latter. It possesses peculiar properties, among these being extreme elasticity, and great tenacity. It is insoluble in water, alcohol, alkalies and acids, with the exception of concentrated nitric, and sulphuric acids, but is soluble in the ethers, chloroform, and best of all in bi-sulphide of carbon. When pure it is colorless, with a semi-transparent appearance. The tree that produces the gum, grows in nearly all tropical countries, but the quality varies materially with the locality, not only in the amount of foreign material which it contains, but in the nature of the caoutchouc itself. The best quality is the product of trees which grow in the provinces of Para and Caera, in the northern portions of Brazil. Not only is this gum purer and stronger, but it is usually better cured than that produced in many localities.

There are various methods of mixing the sulphur with the rubber. It is not sufficient that the two be merely brought together. The sulphur must be in actual combination with the rubber. If a sheet of pure rubber be immersed for a few moments in a bath of melted sulphur, it absorbs about one-third of its weight, but although its color is changed somewhat, it is yet unaltered in its characteristics, because the two are not yet chemically united. But, if it now be subjected to a sufficiently high temperature, combination sets in, and the result is what is known as vulcanized rubber. If the melted sulphur bath be at a temperature of 320° F., the absorption and incorporation occur simultaneously. Vulcanization of rubber, therefore, is not the application of heat, but the combining with sulphur, which does not take place at ordinary temperatures.

A temperature of 320° is not necessary for the vulcanization of rubber. In fact, if it be raised to this point, the character of the product is materially injured. If the sulphur be thoroughly mixed with gum, and the whole be subjected to a temperature as low as 240° F. for a sufficient time, it becomes vulcanized and will be more elastic than if vulcanized for a shorter period at a higher temperature. Any point above the melting point of the pure gum is sufficient, if enough time be allowed for the combination to be perfected.

If a larger proportion of sulphur be mixed with the rubber, and the vulcanizing process be done at a high temperature, or be long continued, the character of the product is materially changed, and hard rubber, or ebonite, is the result. About 40 per cent. of sulphur is ordinarily used for this purpose. A cheaper kind of rubber is commonly employed, or it is "loaded" by mixing with it a considerable quantity of some earthy material. The prepared gum is colored by incorporating sufficient whiting or lampblack. Dental rubbers are colored by vermilion.

Rubber may be made porous when vulcanized, if there be incorporated in the gum any substance that gives off a gas at the vulcanizing temperature. Porosity is always the effect of some decomposition within the substance of the mass when vulcanizing. Thus, if alum shall have been used in coagulating the juice of the tree, and it shall not have been entirely removed, the result will be a porous rubber when vulcanized. Carbonate of ammonia will produce the same effect, as will small particles of wood, or other decomposable material It is possible, too, that rubber which is hygroscopic through having been precipitated by salt, may contain sufficient moisture to make it porous when the mass is raised above the boiling point of water. If the temperature be suddenly raised to a high point, the rubber may become fixed and vulcanized in a porous condition, when if more time were allowed the vapors might escape, and if the prepared gum were under pressure it might become solid. The sponginess is not due to any changed condition of the rubber itself, but to the presence of a distending gas. Any uncombined sulphur is injurious, but an excess of sulphur is desirable to insure perfect vulcanization. It should be removed from the finished product by a solution of caustic soda, or some other solvent.—*The Dental Practitioner.*

BOOK NOTICES.

THE ANGLE SYSTEM OF REGULATION AND RETENTION OF THE TEETH. Third edition, revised and enlarged. By Edward H. Angle, D.D.S., former Professor of Histology and Orthodentia, and Comparative Anatomy of the teeth, in the Dental Department of the University Minnesota. Published by "The Wilmington Dental Manufacturing Company," 1413 Filbert St., Philadelphia, Pa., 1892.

The above work, which has gone through its third edition, is published in pamphlet form, for the modest price of 75 cents. The suggestions, illustrations and examples it contains are worth ten times and more the price the publishers ask for it. It is written in a

plain, eloquent, terse and explanatory style, so that no one who reads it, and takes the trouble to study out the different applications of force, in the bringing of irregular teeth into line, can fail to comprehend what is set forth, and if endowed with mechanical ability, fail to be able to construct or put together (since many of the appliances are on sale) such fixtures as are intended to do the work of Regulation and Retention.—Ed.

A Plain Talk About the Teeth. By Geo. H. Chance, D.D.S., Professor of Dental Pathology in the Medical Department, Willamette University, and Clinical Instructor in Dental Department, University of California. Portland, Oregon: F. W. Baltes & Co., Printers. 1892.

The author has set forth in this little pamphlet a popular treatise, which conveys much instruction to the heads of families and the general public about the teeth. It treats of the Temporary and Permanent teeth, the time of their eruption. The structure, formation, composition and functions of the teeth. The predisposing and exciting causes of their decay. Teething, filling the teeth, cleaning the teeth, &c. Works of the kind should be freely distributed to the hands of the public, and to the heads of families.—Ed.

Questions and Answers for Dental Students in Three Parts—viz., Part 1st, Pertaining to the Freshman's Course; Part 2nd, Pertaining to the Junior Course; Part 3rd, Pertaining to the Senior Course. By Ferdinand I. S. Gergas, M. D., D.D.S. Baltimore: Snowden & Cowman, Publishers, Dental Depot, 9 West Wayette Street. 1892.

Professor Gergas has added another valuable literary contribution to his other labors. His "Dental Medicine," his late edition of "Harris and Gergas Dictionary of Dentistry," his revision of the standard work "Harris' Principles and Practice of Dentistry," are books which doubtlessly have a place in every Dental Library, has placed the profession under many obligations to him. In the present work he gives his labors to the smoothing of the path of the dental student, thus making both the young and the old his debtor. We have always held that the most pertinent way to teach is by definite questions and answers. In this way something definite and tangible is eliminated, and the subject is more easily impressed on the mind.

The work is published in three parts, a separate volume for each, and each part with such studies as engage the students for that particular course. The plan of the work is excellent, and the books

will doubtlessly be in the hands of every student contemplating the study of Dentistry. We commend the work as a valuable aid to the student.—Ed.

ITEMIZED BILLS.

An old church in Belgium decided to repair its properties, and employed an artist to touch up a large painting. Upon presenting his bill the committee in charge refused payment unless the details were specified, whereupon he presented the items as follows:

Items.

To correcting the Ten Commandments,	$5.12
Embellishing Pontius Pilate and putting new ribbons in his hat,	3.02
Putting new tail on the rooster of St. Peter and mending his comb,	2.20
Repluming and gilding left wing of Guardian Angel,	5.18
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Renewing Heaven, adjusting the stars and cleaning up the moon,	7.14
Touching up Purgatory and restoring lost souls,	3.06
Brightening up the flames of hell, putting new tail on the devil, mending his left hoof, and doing several odd jobs for the damned,	7.17
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THE PRACTICAL PLACE.

Abscess Evacuator.

Take a rubber polishing cup and plug the mandrel hole with a piece of gutta percha, which must not project on the inside of the cup. Then wet the inside of the cup, and place it over the gum so as to cover the opening into the abscess. Gently press the cup flat upon the gum, and upon removing the finger the elasticity of the cup will cause sufficient suction to fill it with the contents of the abscess, which by repeatedly applying the cup may be completely evacuated.

Medicaments placed in the tooth-cavity may likewise be drawn through the sac and sinus, and immediate root filling be practiced with greater prospect of success than by any other modes of practice. —*Cosmos.*

WARM FEET AND A COOL HEAD insure good digestion. A Switzerland dentist recommends "a warm foot-bath after the day's work is over, as it promotes the circulation and relaxes the nerves." The best time to indulge in this luxury is just before going to bed.

DR. TAFT believes in compound fillings. His practice is to fill the cavity to within about an eighth of an inch of the top with amalgam, using broad points at first, then finer ones, followed with Watt's crystal gold, and finishing with foil or pellets. By this method the doctor avoids unnecessary undercuts and saves time.

IN SENSITIVE DENTINE, when patients are extremely timid, Dr. Bogue dips a pledget of cotton into carbolic acid, and then into powdered cocaine, and places it into the cavity. This, he says, will obtund the sensibility enough to use granulated chloride of zinc with little or no pain. In ninety seconds the insensibility of the cavity is complete.

TO HARDEN IRON ALL THROUGH.

Ox hoofs and leather are soaked in French nut oil, and are then burnt, pulverized, and mixed with sea salt and potash. The following proportions are used: 30 per cent. of hoofs, 30 per cent. of leather, 30 per cent. of sea salt, 10 per cent. of potash. This product is said to harden iron all through.—*Scientific American.*

DIRECTED TO THE WRONG TOOTH.

Dr. Cooke says: I remember an example in a right upper second molar which was very lame on percussion. The patient said it had ached all the previous day and night. There was no decay, and it did not look as if the pulp were dead. I could see no reason why it should have caused all that trouble. The wisdom tooth behind was through the gum—it did not articulate with the lower teeth, but was in close contact with the second molar. The wisdom tooth was extracted; the patient had no more trouble, and the evidence was quite conclusive that the slanting of the third molar, acting as a lever on the second molar, was the cause of the trouble.

THE

Dental Office and Laboratory.

FOURTH SERIES

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A CASE OF CONTOUR FILLING IN THE DENTAL LABORATORY.

PREPARED FOR THE DENTAL OFFICE AND LARORATORY.

BY THEODORE F. CHUPEIN.

By an examination of Fig. 1, it will be seen that the left central incisor presents a case for extensive contour filling. In a case of this kind unless reliance be placed on a wire cemented, or otherwise fastened into the root canal as shown by Fig. 2 the operator could not look for a long life for his filling, since there is so little of the distal margin of the tooth left to make an attachment, and if this *were* done it would still further weaken this part of the tooth, and consequently endanger both the remaining wall as well as the filling.

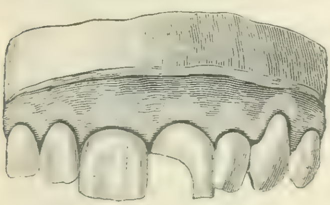

FIG. 1.

Such a case would be more appropriately crowned than filled; but there are persons who hold so much to the last vestige of their own teeth, rather than resort to artificial ones, that though they may detest the display of gold in their teeth prefer this to having a false tooth.

To fill a cavity such as is shown by Fig. 1, is beset with considerable labor, strain and endurance to both patient and operator, and when both have submitted to these and the operator examines his work to find it dense, solid, hard, fully contoured and nicely polished he feels at the time repaid, in a measure, for the pains he has taken to accomplish the result, and the patient views the work and is delighted that she has had her own tooth saved. But with the most faithful performance of such fillings, if

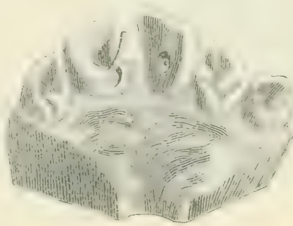

FIG. 2.

after a year or two the case be examined the filling would doubtlessly be found pitted or defaced, or a corner of the gold broken off, or a piece of the enamel fractured, marring the beauty of the operation, and necessitating repairs, which not only causes dissatisfaction on the part of the patient, who has doubtlessly paid a high fee for the operation, but gives chagrin and disappointment to the operator, to see the work he spent so much time, care and labor over, fail in so comparatively short a time.

When these things are considered, any plan which will lessen the labor, lessen the strain, and lessen the expense, and promise as good, if not better, results, should be carefully considered, *and tried* to ascertain its merits.

In view of this we constructed for Dr. L. Ashley Faught, at his suggestion and directions, a solid contour tip or filling, all of which was done in the Dental Laboratory, involving, it is true, an hour and a half or two hours work, yet work of such a nature as not to cause strain, excitement or exhaustion, and which, when finished could be inserted for the patient in a half hour or less, and which would compare favorably with a most skillfully executed contour operation.

The mode of procedure was as follows: A very small piece of modelling compound was softened and an impression taken of the interior of the cavity. When this was hard it was removed and trimmed, so that it would lay snugly in place just exposing the borders of the cavity. An impression of the teeth was then taken, and when removed from the mouth the little impression of the cavity was taken out and put in its place in this large impression, after which the root canal was prepared and the apical foramen sealed.

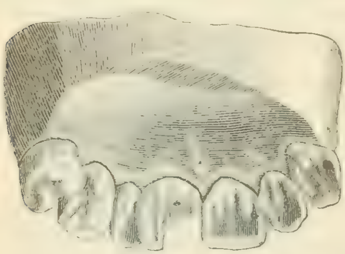
FIG. 3.

When the model was made from this impression the case disclosed such as is shown by Fig. 3, which is the same as Fig. 1, only viewed from the palatal aspect. The cavity in the tooth of the plaster model was then carefully fitted with platinum foil, and this was permitted to slightly overhang the borders of the cavity, the object of this being to give a little surplus to the tip to allow for filing and dressing. The root canal was bored out in the model, the same as in the tooth in the mouth, and a piece of platinum wire was forced through the platinum lining, about a quarter of an inch, into the root canal, permitting about one-eighth, or one sixteenth of an

inch of the wire to remain above the lining within the cavity. The lining and the platinum wire dowel were now fastened together by means of adhesive wax. By means of the piece of wire which protrudes into the cavity, the lining can be lifted carefully out with the tweezers, when it is invested in plaster and sand, the adhesive wax removed, and the dowel and lining united with pure gold ; see Fig. 4.

This being accomplished, it was replaced on the model and wax built out on to it slightly in excess, but in the shape and contour desired. This was removed from the model by dressing away the right central incisor (plaster tooth) of the model, as shown by the mark on this tooth in Fig. 1. The wax contour or tip affixed to the lining and dowel was then bordered all around with very thin platinum foil so as to form, as it were a little box, when it was invested in plaster and sand in such a way that gold could be fused into the matrix formed in the investment. The wax was removed from the investment by pouring boiling water into it. The investment was then gradually heated and gold 22 karat fine was melted by means of the pointed blaze of a gas blow pipe, until the mould was filled. Unless the wax that formed the contour is bordered with platinum as described, the gold cannot be fused next the plaster investment, except at the expense of considerable gold, and even then with not nearly that nicety of result, as it can be by bordering it, or boxing it, with platinum foil. When cold the contour was laid in acid, to remove the borax used as a flux, after which it was ground, filed, trimmed and polished. When ready for insertion it presented the appearance shown by Fig. 5. A wafer of gutta-percha was passed over the dowel, as shown by Fig. 6, and this being softened it was put in position over the remains of the tooth, and pressed to place. It was again removed and the excess of gutta-percha neatly trimmed away with fine small sharp curved blade scissors. Phosphate cement was then mixed and carried to the cavity and root canal, and a little of the same smeared over the dowel (which should be nicked) when the solid gold contour was carried to its place and held until the cement hardened.

FIG 4.

FIG. 5.

FIG. 6.

After this the excess was trimmed and the operation completed.

The solid melted tip is so hard that there is no chance of its pitting or breaking and by the interposition of the gutta-percha next the borders of the cavity, a cushion, as it were, is provided, whereby the

force of a hard bite prevents fracture or chipping of the enamel. The filling is securely anchored into the root of the tooth, so that no dependence is placed on the weak remaining part of the crown to give it support. In appearance it could not be detected from a well executed and laboriously constructed contour filling, while the margins can be better finished than one of these, and the contour more accurately carried out.

We will say that the idea is entirely that of Dr. Faught, and all credit for it due to him.

[FIFTEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

Q. Is the file the only instrument used for separating the teeth?

A. No. Corundum and shellac disks, or corundum and rubber disks, mounted on suitable mandrils and used with the dental engine are used for this purpose.

Q. Are these disks as effective as the file?

A. To begin the work they are more so, because the enamel is so hard that often it will turn the teeth of a file tempered as hard as steel can be. But once this tissue is removed the permanent separation of the teeth should be conducted with a file, as the shoulder, so important to the integrity of the operation, may be cut away, or destroyed by one or two revolutions of the disk, which cannot be as accurately directed as the file. After the decay is removed, and the spaces made as directed, the engine, with soft rubber or celluloid disk, charged with fine pumice will be found a most valuable instrument in imparting a smooth surface and high polish to the teeth thus treated.

Q. How should the enamel chisel be held in making spaces for filling or removing superficial decay in the front teeth?

A. The operator should be on the right, the patient to the left. The handle of the chisel should be grasped in the right hand, in the palm, with all the fingers closed on it. The thumb should rest on the tapering shank of the tool to about a half inch from the end of its cutting blade. The ball of the thumb should rest against the cutting edge of the front teeth to prevent slipping. The arm should be pressed close to the operator's body for the same purpose. Pressure should be made *entirely with the wrist* and not with the forearm.

Q. How should the operation be conducted?

A. A chisel with a small very hard point should be the first used,

and the enamel abraided, crushed or powdered by pressing these into, or on the decayed surface. Pressure should not be violent, but steady, with an ever watchful guard against slipping. As the decay is thus gradually removed or the space increased, its shape is better made with chisels having larger blades, and of such shapes as to accomplish the object.

Q. What is the next step in the treatment of dental caries?

A. The separation or space being formed the decay is then removed.

Q. How is this done?

A. With small instruments called excavators, which are instruments having small delicate cutting points, made of different forms and bent at various angles, in order to reach with more facility the situation of the decay.

Q. What should be the aim of the operator in making his approach to a decayed cavity in a tooth?

A. It should be his aim to make the approach as direct as possible—nearly in a straight line—and to use instruments with as few curves as possible.

Q. How should a cavity of decay be prepared?

A. On the masticating surfaces of the molars or bicuspids, on the palatal surfaces of the incisors, or the buccal surfaces of the molars, the decay may be removed with excavators, or with small burs used with the dental engine.

Q. What should be a preliminary to the use of burs in the dental engine?

A. The application of the rubber dam.

Q. Why?

A. Because if these burs be used in a cavity flooded by saliva, the leaves of the bur become choked with tooth bone, and the tool revolves without cutting.

Q. Is there any rule in the use of burs in the dental engine or excavators, for the removal of decayed tissue?

A. Yes. The beginning should always be made with small blades or small burs.

Q. Why?

A. 1st. Because generally the orifice is small and requires such. 2nd. Because small points appear to give less pain than larger ones, where a larger chip of decayed matter is removed at one cut with a larger blade.

Q. Should any definite shape be given to the prepared cavity?

A. A cavity should be made as nearly round as possible, yet should there be radiations from a main cavity leading into fissures, where

decay is observed, these places may be cut out from the main cavity, without incorporating all these fissures into a large round or nearly round cavity. Besides this, the *floor* of the cavity should be *level* or nearly so, and the *walls perpendicular.* The cavity should be *slightly* larger *within* than at its orifice, and very deep undercuts should be avoided. Overhanging pieces of enamel, though these may be strong, shonld be crushed down, or preferably, burred away with fine-cut burs in the dental engine, and the margins or borders of the cavities made smooth.

Q. Do cavities of decay generally assume a round form?

A. They do not, and this shape or its approximation must be made by the operator.

Q. Can this be always done?

A. No. As in the case cited of radiating fissures in a molar crown cavity. In cavities in the buccal faces of the lower molars leading from these along the fissures, often found from such cavities to the masticating surfaces of these teeth. In cavities in the proximate surfaces of the incisors where decay leads towards the cutting edges of these teeth between the two plates of enamel, or where decay has involved the proximate as well as the masticating surfaces of the molars or bicuspids, the round form is impracticable.

Q. Which cavities are most easily filled?

A. Cavities in the masticating surfaces of the molars and bicuspids, in the buccal surfaces of the lower molars, where these have no extensions but consist of a well-defined round hole; cavities in the palatal surfaces of the upper incisors, and cavities on the labial surfaces of the upper incisors, when these are below the enamel border or not near the neck of the tooth.

Q. What is the first procedure in the treatment of approximate decay?

A. The gaining of room or space whereby the cavity of decay may be reached and prepared.

Q. How is this effected?

A. By removing a portion of the teeth, so as to obtain this space, either with files, chisels or disks in the dental engine or by pressure.

Q. How is space obtained by pressure?

A. In the use of instruments called "separators" which by the application of wedges or screws the teeth are forced apart, or by the employment of cotton, tape wood wedges or india rubber the teeth are forced apart in order to afford room for the performance of the operation.

Q. Have these methods of gaining space any indications?

A. Yes. If decay has progressed to such an extent as to involve a large part of the proximate surface of the teeth, leaving the enamel thin and friable, a separator should not be used. But where the patient is of a scorbutic diathesis or is susceptible to inflammation, or where the enamel is dense and strong, then the separator may be used.

Q. How is rubber used to separate the teeth?

A. Sometimes the teeth are so close together that several applications of this material have to be made before space enough is obtained. In such cases one or two thicknesses of rubber dam is first applied which is succeeded in twenty-four hours by a greater number of thicknesses, when finally the ordinary separating rubber may be appplied so as to acquire the necessary space.

Q. Is the rubber to be applied in any particnlar way?

A. It should rest at the points of contact. If put below this it will fall out, if above, it will press against the gum, giving the most intolerable pain.

Q. What should succeed the application of any separating agent, except the separator?

A. The space gained by any of these agents should be maintained by packing gutta-percha between the separated teeth.

Q. What is the object of this?

A. The separation of these teeth by gradual pressure causes great irritation, and frequently leaves the teeth loose and sore; the object of packing gutta percha in the space is to permit the teeth to recover from the movement to which they have been subjected by the elasticity of the rubber, or the swelling of the tape, wood or cotton wedges, and become, in a measure, more comfortable when the operation of filling is performed.

Q. How many teeth should be separated at one time?

A. Only two. And except in the use of the separator, the force should be gradual, occupying from three to five days.

Q. What is urged by the advocates of the separator to gain space?

A. That the patient suffers less than when gradual pressure is employed.

Q. After the teeth are separated, the decay removed, the cavity shaped and filled, do the teeth remain separated?

A. They do not, but return of their own accord to their former positions.

Q. Should the teeth have been filled, as they frequently are, by

simply preparing the cavity and filling after space is gained, what reason have we to infer that they will not decay again when they return to their normal position?

A. Decay generally occurs, somewhere in the neighborhood of the point of contact, and as the filling is inserted with the effort to obtain a slight protuberance it is inferred that the teeth are thus kept apart by so miuute a point of contact that the deleterious agents which caused the decay in the first instance would be prevented by thus making the spaces or parts self-cleansing.

Q. Is the operation of separating the teeth admissible at all ages?

A. It is thought not to be safe after the fortieth year.

Q. How is decay removed from deep seated cavities?

A. It is removed little by little with excavators or burs in the dental engine.

Q. Does not the removal of decay give pain?

A. The removal of decay should not give pain; as decayed dentine is dead tissue, and dead tissue should be insensible; yet we find it sometimes exquisitely sensitive, and therefore must regard this as an abnormal condition. But in preparing a cavity for the treatment of dental caries a certain shape must be given to it in order that it will retain the filling material, and in obtaining this form, the healthy dentine is cut, and the pain which is experienced comes more frequently from cutting the normal tissue than cutting the decay.

Q. What is done to mitigate or to get rid of this pain?

A. Obtundents are used.

Q. What are the chief of these?

A. Carbolic acid, Chloride of Zinc, Tincture of Cannabis Indica, intense cold obtained by the spray of an atomizer, warm air produced by the hot air syringe, or compressed air apparatus, dehydration produced by the application of absolute alcohol aided by the rubber dam, etc., etc., etc.

Q. Are these measures always effectual?

A. Not always, but the intense pain is often considerably mitigated with these agents.

Q. What was formerly used for the suppression of this pain?

A. Arsenic. But the poison was so readily absorbed by the dentine that it was soon found that the pulp was destroyed by the application, so that the practice was condemned by the profession and considered most reprehensible. It is contended, however, that if arsenic be used and not left in a cavity over an hour or two (at the furthest) these sequences will not occur, and the pain of the preparation of a cavity can, with it, be entirely overcome.

Q. What other agent seems to be most used to allay the pain of sensitive dentine?

A. The Chloride of Zinc.

Q. Will this not destroy the nerve as well as Arsenic?

A. Repeated application of it will, yet it seems to be absorbed by the dentine more slowly and is therefore more under control.

Q. How is it applied?

A. Those who rely on it more than any other agent apply a small crystal of the salt in the cavity and let this deliquesce by its absorption of moisture from the cavity or by the moisture it derives from the dentine. It is applied thus when the teeth are protected from moisture by the rubber dam.

Q. Which mode of combating sensitive dentine seems to have the largest number of advocates?

A. The method by dehydration. This is effected by the application of the rubber dam, and by robbing the dentine of all its moisture, by the application of absolute alcohol, or by thoroughly drying the cavity with hot air, or compressed air.

Q. What is the philosophy of this pain?

A. It is supposed that in preparing a cavity for filling the instruments cut through the nerve fibrillæ and pain is thus carried or conducted to the nerve proper; but by thorough drying or dehydration, these fibrillæ shrink within the tubes of the dentine and thus permit the cutting instruments to pass over without touching them, and in this way pain is avoided.

WHY CENTRAL AIR CHAMBERS SHOULD NOT BE USED IN DENTAL PLATES.

By Stephen Lee, Pawtucket, R. I.

Is it not malpractice to use air chambers in dental plates?

If we should disfigure any other part of the body as we do the roof of the mouth we would call it by some bad name.

Air chambers cause unnatural formations in the roof of the mouth, in proportion to the size and depth of the chamber used on the plate; and the thickness to which a plate must be made to permit such a depth of the suction, often impedes rather than facilitates the ennunciation, to say nothing of the unpleasant sensation of constant drawing or sucking, until the membrane, drawn into the chamber, becomes callous and lifeless.

Now, how much better, for humanity sake, it would be for all dentists to make their plates, the shape of the mouth, and abandon the useless air chamber!

I wish to say here how every dentist can satisfy himself in five minutes of the inutility of the air chamber.

When you have fitted your teeth to the mouth, you say to yourself—" What a good suction the air chamber makes to this plate"—but remove the plate from the mouth and fill the air chamber with soft beeswax, and have it so it will not bear on the roof of the mouth, and you will find, perhaps to your satisfaction, the same suction that there was before.

Now I wish to say to the profession what has been my experience in a practice extending to *thirty-five years*, in Pawtucket, during which time I have made 5,000 sets of teeth and every set *without* an air chamber.

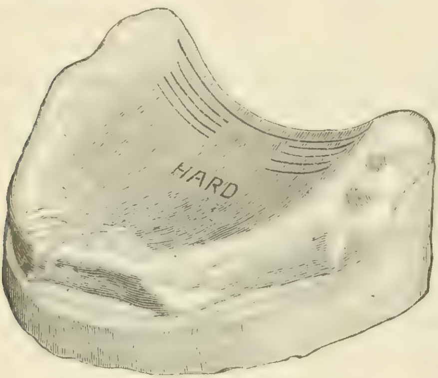

FIG. 1.

My method is to make three or four ridges across the back part of the roof of the mouth on-the plate by scratching gullies into the model, as shown by Fig. 1. If the gum is soft I make these from one side to the other, across the entire model, but if it is hard (as the model shows) then I do not make them entirely across but only on each side of the median line as Fig. 1 illustrates.

If the plate bears too hard in any one place, I pair off *a little*, for if it clears the thickness of paper it is all right.

THINGS PRACTICAL IN DENTAL PRACTICE.

BY J. G. TEMPLETON, D D S , PITTSBURGH, PA.

AT the Ohio State Dental Society, Dr. Templeton gave an interesting talk on the above subject. Some of the ideas given were as follows:

Instrument Polisher.—Burnishers give better results when new than when tarnished, and it is essential to keep them finely polished. In fact, it is desirable to keep all instruments polished. An efficient device for polishing can be made by fastening a piece of sole leather, or a piece of razor strop, on a block of wood of suitable size, and placing a little diamantine powder on the surface of the leather; then polish instruments by rubbing briskly on this surface. Diamantine is

used by jewelers and can be obtained from them or from their supply houses.

To Make Moisture Tight Gutta-Percha Fillings.—Take common resin and dissolve in chloroform to desired thickness; place some of this in the prepared cavity, and by the time the gutta-percha is heated the varnish will be in proper condition through evaporation of the chloroform. The varnish should not extend ts the cavity margins. Apply the gutta-percha as usual, and pack with cold instruments. The cold instruments do not adhere as warm ones do. When completed the filling may be pared off to the proper contour by means of a heated thin-blade instrument, and the filling smoothed by the application of eucalyptol or oil of cajuput.

To Duplicate Models and Impressions.—Take printer's roller composition, melt in a water-bath until dissolved. Grease the model slightly with lard, and place it the same as if to mould a metal die, cover with a metal ring (a tin can opened at both ends will do), and pour the melted composition over the model. Let this stand over night. By morning the material is hardened and the model can be withdrawn. The composition being elastic it retains its shape, and a hundred models may be poured if necessary. Impressions may be duplicated in the same manner, by using impression instead of model.

A Useful Clamp.—Where the lower teeth have short and tapering crowns and it is impossible to make an ordinary clamp hold, use the Lyder clamp, and you will be successful.

To Dry a Cavity Before Filling.—After applying absolute alcohol to the cavity, use a solution of sandarach and ether to line the cavity; dry this with hot air, which forces it into the ends of the tubules, completely sealing them; then proceed with the filling.

In Ligating Rubber Dam, tie a small bead on the ligature, which, when tied around the tooth, will prevent the dam from coming over ligature; the bead should be on lingual side of tooth.

In Articulating Teeth, always take an impression of lower teeth when making an upper set, and in taking the bite have wax trimmed to show the length you wish the teeth to be, and bite into it just sufficiently to show the tips of cutting edges and cusps where the model made from lower impression can be placed in proper position, etc. For double sets, make wax models for contour in restoration of features and to show length of teeth, and then try these models in the mouth, being careful to see that you have it right; then make plaster articulating models for setting up the teeth, setting up the lower ones first against a plaster articulating plate, its articulating surface cor-

responding with the articulating surface of lower wax model, then lay aside the plaster articulating plate and put the model of upper jaw in its place, and set the upper teeth to the lower ones. I adopted this method about twenty-four years ago, and in that length of time have not had to grind a cusp off to let front teeth come together, and can say the same for the method of making an upper set alone, which is all due to the care taken to get a correct bite in such cases by taking an impression of lower teeth, which takes a little more time, but is all remunerated for in the satisfaction one gets from seeing that there is nothing more to do when the piece is placed in the mouth with masticating surfaces perfect, and no need of any "grinding in" to get the front teeth together.

To Prevent Plaster Adhering to Rubber Plates.—Coat the model with a thin solution of soap and water just before packing the case.

A Method of Securing Perfect Impressions for Partial Upper Plates.—To take an accurate impression of the mouth for a partial upper set of teeth, smear plaster over the roof of the mouth with the finger, take a string about one foot in length, tie the ends together, put the tied end of the loop into the plaster on the root of the mouth, and add more plaster to thoroughly embed the knot, leaving the loop of string hanging down. In placing the plaster in the mouth care should be taken to have it come full half way over the grinding surfaces of molars and bicuspids and cutting edges of the front teeth, then trim the plaster and varnish the trimmed surfaces. The plaster should be so trimmed that it will fill up fully one-half of all spaces between the teeth, then cover all the remaining surface of the mouth and teeth with plaster, being very careful to have the teeth well covered and spaces filled in putting on plaster for the buccal and labial surfaces. When set, the plaster impression readily parts where it has been varnished, the palatal portion is dislodged with the help of the string used, and the pieces are then placed together and model made. If a tooth is irregular, use modelling compound about it and trim suitably; then apply the plaster. When removing it breaks where joined; then remove compound, place in position in the impression and pour the model.

OBITUARY NOTICE.

It is with regret we read the deaths of Dr. George Watt, Dr. W. W. Allport, and Dr. W. H. Rehfuss. The two first, though personally unknown to us, are so well known as pioneers of dentistry that their attributes were recognized by all, while the last was a promising young dentist, cut off in the bloom of youth, usefulness and promise.

THE DEVITALIZATION OF THE DENTAL PULP.

BY W. D. MILLER, M. D., PH D., BERLIN, GERMANY.

The devitalization of the dental pulp has frequently been made the subject of communications to the dental journals, and of discussions in dental societies. Expression has often been given to the general complaint that application arsenic to the dental pulp is too frequently followed by severe pain, and various means have been suggested for rendering that operation less trying to the patient.

My experience in the devitalization of pulps differs somewhat from that of many writers on the subject, in that I am able to perform the operation without pain; at least I have not had a single case in the last two years in which the patient has complained of severe pain after the application of arsenic, and in nearly all cases they have said they had felt nothing whatever. A description of the manner in which I devitalize pulps may, therefore, be of service to some of the readers of the *Dental Practitioner and Advertiser*. Not that I employ different materials from anyone else, or use different methods, but I certainly do accomplish the result without pain.

With occasional exceptions, I adjust the rubber dam where arsenic is to be applied, then bathe the cavity thoroughly with carbolic acid, and remove the decayed dentine as thoroughly as possible without producing unnecessary pain. I find it desirable, as others do, to have a large surface of exposure to which to apply the arsenic, but I apply it to a small exposure rather than give the patient pain in the attempt to enlarge it. I now place two or three drops of carbolic acid upon a glass slab, and add as much of the hydrochlorate of cocaine as it will dissolve. A pledget of cotton, supersaturated with this solution, is placed in the cavity and left there while I am preparing the paste. I have in a small bottle a preparation consisting of equal parts of acidum arsenicosum and morphinum muriaticum, with just enough carbolic acid to hold them together (not to make a paste). I take a bit of this a little larger than a pinhead, and make a paste of it with the saturated solution of cocaine in carbolic acid. I now remove the pledget of cotton from the cavity, take the paste from the point of a suitably shaped excavator, and apply it directly to the point of exposure. Over this I place a small, flat pledget of cotton, well saturated with the cocaine-carbolic acid solution, being careful not to let the cotton extend over the margin anywhere, and avoiding every trace of pressure.

As far as the action of the cocaine is concerned, I have no doubt the same result may be obtained by incorporating the crystals with

the ordinary thin arsenic paste usually employed. So far as I know, the following formula, which has been repeatedly recommended, would serve the same purpose.

℞ Acidi Arsenicosi..
Cocaine Hydrochlorate,........................aa, 0 5
Acidi Carbolici, q. s. ....

Personally, I have always used the fresh crystals of cocaine.

Now comes a very important part of the operation, that of retaining the application in position. If I had my enemy in the chair, and wished to make him atone in one night for all the sins he had ever committed, I would take some cotton, roll it up into a hard ball, saturate it with sandarac varnish, and force it into the cavity. The use of cotton and sandarac for retaining applications to the pulp appears to me to be utterly inexcusable. I think that one would be justified in calling it not only irrational, but slovenly practice. More or less pressure is absolutely necessary to make the cotton stay in place, and this is sure to increase the probability of pain in a high degree, to say nothing of the danger of causing minute quantities of the arsenic to exude and come into contact with the gums, while the cotton itself, unless packed very tight, soon becomes permeated with the secretions of the mouth.

The method of covering applications to the pulp with gutta-percha has always appeared to me very objectionable, simply because it is next to impossible to cover the bottom of a cavity with a pledget of cotton, supersaturated as it should be with some local anæsthetic, and then fill over this cotton, wet with gutta-percha solution, so as to obtain anything like a watertight filling, without exerting pressure upon the cotton. For all cases where we have to enclose applications on cotton, the oxysulphate of zinc is vastly superior to gutta percha. I use the preparation known as Fletcher's artificial dentine, but am not acquainted with preparations of a similar character which may be on the American market. I mix the preparation moderately thin, so that when it is taken upon the spatula it hangs down slightly. It should not, however, be thin enough to drop off. For inserting it, I use in most cases a very thin sickle-shaped spatula. Taking a small quantity upon the end of the spatula, I draw it across the margin of the cavity, just about as one draws a plaster knife across the edge of a board to wipe the plaster off. I thereby fix the cotton on one margin; then in the same manner it is covered on the opposite margin, eventually a third or fourth portion being necessary to complete the operation. For approximal cavities in molars, an instrument bent upon its surface will sometimes be found preferable to a sickle-shaped

one. The method of applying the cement is also somewhat different for molars, but a little experience will soon make the manner of manipulation apparent to every one. Like everything else, it requires some practice.

With the oxy-sulphate, or even with plaster of Paris, one can place a wet pledget of cotton in the open end of a tube $\frac{1}{4}$-inch in diameter, and fill over it without displacing the cotton, or exerting the least perceptible pressure upon it, a thing which cannot be done with gutta-percha, or any other material that I know of. My manner of applying arsenic was put to a severe test a few days ago in two quite similar cases, one of which I may relate. A middle-aged gentlemen, of nervous temperament, presented himself, with an aching tooth on the right side of the upper jaw. An examination revealed a second molar, decayed on the distal surface. The cavity contained a pledget of cotton, the removal of which was followed by a paroxysm of severe pain, and a drop of pus was seen to exude from the point of exposure of the pulp. I make it a rule never to apply arsenic to an aching or highly inflamed pulp, but in this case, for special reasons, I decided to deviate from the rule. I at once inserted a pledget of cotton, saturated with the cocaine-carbolic acid solution, which was allowed to remain about five minutes, the pain gradually diminishing in intensity: I then asked the patient to rinse his mouth (not a necessary part of the procedure, however,) and renewed the application, which I left in the cavity while I was preparing the arsenic paste. The latter was applied as described above. When I had finished, there was still some grumbling pain, which disappeared gradually and entirely inside of ten minutes, and the patient did not have a trace of pain afterwards. The pulp could be extirpated on the following day. Thus the application of arsenic was made the means of completely stilling the pain, instead of producing the violent suffering so often complained of. In another case, two days ago, a young lady came to me with an aching tooth which had troubled her more or less every day for weeks. It was so sensitive that the touch of the finger, unless quite warm, produced severe pain. I applied arsenic with my usual care, and from the moment she left my office she felt nothing whatever to remind her that she had a decayed tooth.

I attribute my success in this operation to the observance of the greatest possible delicacy in making the application to the pulp, in particular to the avoidance of every trace of pressure, and secondly to the maintenance of a constant anæsthetic condition by use of the cocaine carbolic solution.

ADVANTAGES OF NITRATE OF SILVER IN DENTAL PRACTICE.

In presenting something of my personal experience in the use of nitrate of silver in the treatment of diseases of the teeth, it is with the hope that as the subject has been recently discussed in dental societies, by reason of the able papers of Dr. Stebbins, it has not become threadbare, and something of interest will be found in its consideration. The character and scope of the discussions that I have read on the use of nitrate of silver for the treatment of diseased teeth, have been such as to impress me with the belief that its benefits for such use are not generally understood and appreciated.

Nitrate of silver is conceded to rank as one of the most efficient and reliable remedies in medicine and surgery, and when its merits are fully known it is believed that it will be found equally efficient in the treatment of a large class of diseases of the teeth.

Take for instance decay in temporary teeth. We all know from individual experience how trying it often is to fill the teeth of small children in the ordinary way of making such operation; how they resist all efforts to excavate and fill sensitive cavities. By the use of nitrate of silver these operations are more easily made. Take approximal cavities in the posterior teeth, where the child is not too fearful and timid; cut away the walls to a V-shape, and with a piece of gutta-percha, softened by heat, of the proper size to fill the space, bring the surface to come in contact with the diseased part of the teeth in contact with powdered crystal of nitrate of silver, and carry it to the place in the tooth or teeth prepared for its reception, packing it firmly and leaving it there to be worn away by use in mastication; when that takes place, the surface of the teeth treated will be found black and hard, with no sensitiveness to the touch or to change of temperature, and they will remain so indefinitely. In case the child is so timid and fearful as to prevent this course, dry the cavity, take out such softened dentine as the patient will permit, carry the crystal on softened gutta-percha into the cavity and pack it, leaving it until such time as desirable to replace it with a more thorough operation. On removal of this filling the dentine will usually be found hard without sensitiveness, and needing but little excavation for the final filling.

I have treated diseased pulps with the nitrate of silver crystal very frequently since early in my practice, especially in temporary teeth, where devitalizing pulps with arsenious acid is unsafe, applying the crystal direct to the exposed pulp, usually with relief to the patient.

Nitrate of silver is a resolute remedy; it cauterizes the surface of the soft tissues to which it is applied, but does not penetrate them as does carbolic acid, nor does it involve the entire pulp in an inflammatory process, tending to destroy the whole mass, as does arsenious acid.

In case of extreme sensitiveness about the necks of the teeth at the margin of the gums, where the tendency is to softening of the tissues of the tooth, a condition very annoying to patient and troublesome to the dentist, nitrate of silver has proved more successful with me than any other remedy in checking the progress of the disease and relieving the patient. The salt may be applied directly to the sensitive part without pain to the patient. A good method that I have practiced is to cover the parts after the nitrate is applied, with a phosphate filling-material of a cream-like consistence. That hardens, and prevents the washing away of the remedy and the surrounding parts from coming in contact with the salt.

Erosion or wasting of the teeth is checked more perfectly by nitrate of silver than by any other remedy that I have ever used. The salt is applied to the affected parts, and covered with a phosphate filling to protect and retain it in place until it is firmly established in the dentine. In cases where the progress of the disease has gone so far as to require restoration by filling, this preliminary treatment is very beneficial in preventing a further waste of the tooth-substance and consequent failure of the operation.

In cases of superficial decay in soft teeth, where dark surfaces are not objectionable, nitrate of silver is very beneficial. By removing the softened portion of the tooth, polishing the surface, and rubbing the salt into the dentine, using a warm burnisher, and varnishing the parts to protect and hold the remedy until taken into the organic matter of the tooth, you will have a dense, hard surface, free from sensitiveness in mastication or change of temperature. In filling cavities in this class of teeth having an excess of organic matter, with which there is so much trouble from chemical or electro chemical action between the walls of the cavity and the filling, an application of nitrate of silver to the walls of the cavity will effectually prevent these unfavorable results. The remedy is taken up by the dentine penetrating the surface sufficiently to prevent any such action between filling and tooth. This treatment will at times result in a darkish hue to the walls of the cavity about the filling. This I explain to the patients, that they may know that it results from the treatment and that it is a proper and favorable condition for permanency of the operation. Also in crown and bridges where the dentine

is uncovered, it is beneficial to use this remedy on the teeth and roots used to sustain the bridge or crown, as a protection against thermal change and decay. The use of nitrate of silver may be varied by applying the rubber-dam and using a strong solution of the salt, and evaporating the moisture by use of a hot-air syringe. When used in this way, a solution of soda can be applied to the parts to neutralize any acid remaining. In the class of cavities extending so far beneath the soft tissues as to render the use of the rubber dam or matrix impracticable, and a leakage of the surrounding tissues is liable to enter the cavity while introducing the filling, and injure the permanancy of the operation, cauterizing these tissues thoroughly with nitrate of silver will effectually prevent such result.

After the diseased sockets and the deposit from the roots of the teeth are removed, nitrate of silver has proved more successful in restoring a healthy condition of the parts than any other remedy that I have used in the treatment of pyorrhea. The finely pulverized crystals may be applied to the diseased parts by the use of a small spatula of wood or of platinum; by slightly dampening the end of the instrument and applying it to the salts, it will adhere sufficiently, and is easily placed in the space between the gums and the roots of the teeth. After the remedy has been a few moments in contact with the part, it is best to rinse it with water by the use of a syringe.

In extirpation of pulps, where the pulp-canal is sensitive at or near the apex of the root, nitrate of silver crystal carried to the sensitive part and left there for a few hours usually relieves the trouble, and the canal can be filled without pain or danger of unfavorable results.

These are some of the many uses where nitrate of silver crystal is advantageous in dental practice. Nitrate of silver is a powerful remedy. Its acts promptly, with great uniformity, and leaves its track in darkened surfaces when applied to the teeth. This should be considered, and its use governed accordingly.—Holmes (A. M.) *Dental Cosmos.*

FOR SOLDERING IN THE COLD.

Reader, St. Louis.—A man came into my establishment recently and wished to purchase what he called "cold solder," but could give no other description than that it was a mixture of chemicals to be applied cold to metals, and that it soldered them together. I knew of no such chemicals, and told the man so. To day another man came in and asked for the same mixture, calling it by some name which I could not catch, but something like Klinski's or Calinski's

Cold Solder Fluid. Do you know of such a fluid, and if so, how is it made?

We do not know of such a preparation, and think you are probably being "worked" for the benefit of some fellow who will come along in a day or two and want to sell you a few dozen of "Klinski's Cold Soldering Fluid." There is a process of cold soldering which is qnite useful, and in some cases very valuable indeed, but it is not done with a fluid.

It consists of two alloys, the one of metallic sodium and mercury, and the other of metallic copper and mercury, prepared and used as follows: The flux consists of 1 part of sodium to 50 parts of mercury. This must be carefully protected from the atmosphere in a glass-stoppered bottle. This has the property of amalgamating any metal with which it comes in contact, forming an adhesive amalgam even on cast iron. The solder proper is made as follows: Dissolve 10 ounces of sulphate of copper in 2 pints of water, and then precipitate the copper by the introduction of strips of zinc. Wash the precipitate in hot water two or three times, drain off, and for every ounce of precipitated copper add 2 ounces of mercury. Add also a little sulphuric acid (say 15 to 20 drops), to aid in the amalgamation of the metals. The finely divided copper and mercury form a paste which sets and becomes intensely hard in the course of a few hours. It should be made up, while soft, into little pellets and put away. When required for use, first amalgamate the surfaces to be joined by rubbing them lightly with the flux. This is the equivalent of tinning in the ordinary soldering methods. Then take one (or more, as the case may be) of the pellets, and warm till the mercury begins to exude at the surface. Wipe off the exuded drops with a clean rag, and drop the pellets into a small mortar and rub till smooth, or about the consistency of prepared white lead. Smear this over one of the surfaces to be joined, and apply the other surface to the latter as quickly as possible. The joint sets so firmly in the course of two and a half to three hours, that only a hammer and cold chisel (or a degree of heat sufficient to melt ordinary solder) can separate the surfaces.

For an even stronger and much quicker setting solder, where expense is no item, take the following to replace the copper and mercury (using the same flux):

Silver	8 parts.
Tin	10 parts.
Bismuth	1 part.
Platinum	1 part.

Melt together, and cast an ingot. Rasp to filings, or otherwise re-

duce to small particles. When required for use, mix about 3 parts of filings and 1 of mercury in a small mortar till it becomes a smooth paste. This sets in about fifteen minutes, and can not be made workable again by heat; it must be mixed just as required. The omission of the platinum reduces the strength of the solder, and lengthens the time required to harden to about one hour. The omission of bismuth makes a more granular mass, which is better for filling up crevices. With bismuth, it is as smooth and plastic as potter's clay. Joints made by this solder are almost inseparable. It is very valuable in repairing surgical and philosophical instruments, the brazing of delicate springs, and in all cases where the application of heat would be hurtful or destructive.—*National Druggist.*

BOOK NOTICES.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1892. B. H. Catching, D.D.S., Editor and Publisher, Atlanta, Ga. Constitution Publishing Company. 1893.

We have naught but praise for the volume which has just been received. The contents are not only extremely interesting, but they are short, snappy and to the point, and evince the choicest selections from the gleanings of the dental journals. We bespeak for it the most extensive sale, and the best consideration from the profession, as it richly deserves, and no one who invests the price of the book (2.50) for a copy will regret it, and feel that he has not fully received its equivalent.—[ED.

DENTAL SOCIETIES.

THE Thirty fourth Annual Meeting of the Northern Ohio Dental Association will be held in the council chamber at Akron, Ohio, May 9, 10 and 11, 1893. Sessions begin at 10 a m., Tuesday, You are cordially invited to be present.

ILLINOIS STATE DENTAL SOCIETY AND IOWA STATE DENTAL SOCIETY—*Joint Meeting.*—The twenty ninth annual meeting of the Illinois State Dental Society will be held at Rock Island, May 9-12, inclusive. The thirtieth annual meeting of the Iowa State Dental Society will be held at Davenport, May 9 12, inclusive. These cities are located on opposite sides of the Mississippi river and arrangements will be made to hold the meeting jointly, so that those in attendance at the meeting of either society will have an opportunity to listen to the papers, take part in the discussions and witness the clinics of both societies. No efforts will be spared to make this union meeting one of the most

interesting in the history of each society. Members of both societies are urgently requested to attend. All dentists are cordially invited to be present. Every one should bring models, specimens, appliances or anything that may be of interest to the profession.

LOUIS OTTOFY, Secretary Illinois State Dental Society, Chicago.

W. O. KULP, Chairman Executive Committee Iowa State Dental Society, Davenport, Iowa.

DENTAL COLLEGES.

THE annual graduating exercises of the Kansas City Dental College were held at the Coates House on Friday evening, March 3rd, 1893.

The following graduates received the degree of D.D.S.:—

Andrew William Davis, Kansas.
Richard Jefferson Winn, Missouri.
John H. Holke, M. D., Missouri.
W. Harry DeWitt Dwight, Iowa.

Whole number of students during the season number 70.

The faculty address was delivered by Prof. Charles H. Lester, and the degree conferred by C. B. Hewitt, D.D.S., President of the Faculty. J. D. PATTERSON, Secretary.

THE commencement exercises of the Alabama College of Dental Surgery, Bridgeport, Alabama, were held at the Aldhous Building, February 24th, 1893.

Degrees of D.D.S. were conferred by Chas. A. Holmes, President of the Board of Trustees, upon the following candidates, who had completed the third term:—

A. Irene Yokum, Sanford W. Allen, Henry Clay Stephens.

Valedictorian...A. Irene Yokum.

Gold medals were awarded as follows:—

"Founder's Medal," best general average.........A. Irene Yokum.
Best Gold Filling.......................................Sanford W. Allen.
Best examinations, Anatomy and Physiology...A. Irene Yokum.

Addresses were made by W. K. Spiller, Dean; Rev. W. A. Cook, T. M. Allen, D.D.S., and the President of Board, Chas. A. Holmes.

MARTICULANTS:

S. W. Allen, W. H. H. Brown, H. M. Chester, T. E. Garrett, W. L. Helms, F. C. Holmes, J. P. Lovett, H. Renker, H. C. Stephens, B. L. Stenson, W. P. Stinson, E. R. Van Diver, M. L. Wade, W. A. Wood, A. Irene Yokum.

This college complies strictly with the rules of the Association of Dental Faculties.

[Selected Article.]

ELECTRICITY IN TOOTH EXTRACTION.

A small party of medical men and dentists lately met at the Institute of Medical Electricity, 35 Fitzroy Square, W. C., London, to witness a demonstration of the new method of extracting teeth without pain. One of our staff was there. We sent the one who has most experience in the shocks and squirms of the dentist's chair, and he was imbued when he left the office with more than his share of skepticism regarding the powers of electricity in drawing teeth. He came back brimming full of enthusiasm about the "vibrator." That is what the electrical arrangement is called. It is a simple arrangement, consisting of a neat walnut case, within which are a couple of bichromate cells and a Ruhmkorff coil to which is attached a commutator of extreme sensitiveness. The commutator is the secret of the whole affair. It is a thin ribbon of highly tempered metal, secured at each end by an elaborate arrangement of screws. It is capable of vibrating at a tremendous pace—so quickly, indeed, that it is really musical—and the force passing through the coil is regulated until the vibrator is in unison with the key A, which the Philharmonic Society says is equal to 420 vibrations per second.

The operator was Mr. Burgoyne Pillin, L. D. S., who stated that he was a visitor himself, not being connected with the institute. He had four patients in waiting. The first was a young professional man, who seated himself in the operating chair to get a bicuspid extracted. He got the handles of the battery in his hands. One of these is connected with the negative pole: The positive is divided into two, so that one of the divisions is connected with the handle and a wire from the other division is screwed into the handle of the tooth forceps. When the patient takes hold of the handles the current is gradually increased in intensity until the patient can bear no more; then, while the forceps are being introduced, the current is turned off for a second and on again. The rest is the same as without electricity. "Had you no pain?" asked our representative of the patient when the roots of the bicuspid were held up to view. "Not a bit; I only felt the grip." "What did you mean by stretching your body, then?" "Oh, that was when the current was turned on." "You didn't feel the frightful wrench, then?" "No," was the reply.

Our representative was still skeptical, it will be seen. All this skepticism went with the next patient, a young and robust-looking lady, who had the left anterior upper molar troubling her. She took the chair, and quickly enough Mr. Pillin had his forceps on the shell.

Crack it went, and the usual thing followed—three separate extractions, the last bringing away part of the crown and two twisted roots an inch in length—as bad a case as one could wish to see. It took some time to persuade the patient that her tooth was out. "I felt no pain," she said, after she had an affirmative reply to her question, "Is it out?" The next patient was a young lad who declared that he felt like getting a shave (he had not got his first). His lower bicuspid was also quickly brought to view and he went out with a smile.

The next turned out to be a bad case. The tooth was fearfully exostosed, and it was only by a prolonged wrench, which was painful to look upon, that Mr. Pillin got it out; but the patient showed not a trace of pain, and he, like the others before him, was quite free from shock. This is one of the characteristics of the process: there is no nervous shock.

The four cases were typical, and all the experts present were enthusiastic about the success, and loud in their praises of Mr. Pillin's skill. Now, why is it that electricity prevents pain? was the question that every one was asking. "Simple enough," said Dr. Arthur Harries, the physician in the institute. "Electricity travels over the nerve at the rate of 420 vibrations per second; pain travels from the tooth to the brain in one sixtieth of a second. My theory is that the electricity, being so much quicker and having the greatest force behind it, gets to the brain first, and then keeps the line for itself, crowding out the pain." If Dr. Harries' theory is right, what a future there is for electricity in surgery! Chloroform and all other anæsthetics will have to take a back seat, and we shall banish pain simply by not allowing it to be produced.

There are other points about the vibrator which we should like to speak of, but need only mention that there is less bleeding and that it interferes in no way with the operator. It is really a good thing, thoroughly sound in principal and without any humbug about it.—*Chemist and Druggist.*

THE PRACTICAL PLACE.

A Cast Guiding Surface Crown.

Cut the band a little obliquely, and allow the band to be a little bit larger at the cutting end. After soldering the band, it is then placed upon the root and ground to articulate with the opposing tooth, bevelling the band toward the palatine side, allowing the buccal side to remain the length you desire the cusp. Then remove the band, and with the knuckling pliers crimp the point and make the knuckles as desired. I then replace the band upon the root; in the meantime

you can see whether or not it is a good fit. Then place in the band Paris fluxed wax, directing the patient to close the mouth, which gives the articulating point, or the bite of the opposite tooth. With a syringe throw upon it a stream of ice-water. Next take out the crown, and with Evans' wax spatula, trim the feathered edge of the wax next the root, and shape the cusps. With a small ball of wax placed on the palatine side of the inner cusp to form a funnel in the investment, the case is ready to be invested. This is done by taking equal parts of white sand and pumice-stone with an equal part of plaster, being careful to place the buccal side of the band down. The wax is now burned out, leaving a coating of flux. Cut up a lot of twenty-carat solder very fine, rub it on the glass with borax and water, and with the blow-pipe (without the flame) dry it off. This leaves a little coating of borax on each piece of solder. I have found this absolutely necessary to get a perfect fusion without occasionally burning the twenty-two carat band. The mould formed by the wax is now filled with this solder. This gives a perfect cast, which only needs to be polished and placed in position. The patient has only to close the mouth and it fits like a "clock-wheel."—DR GORDON WHITE, in *Sou. Dent. Jour.*

WHEN I was a little boy, about six or seven years old, I had a tooth extracted. The doctor wanted to pull it out, but I never liked to be hurt, and, of course, objected. But on the promise of the doctor that he would not pull it, but just look at it, I allowed him to put the pliers on to see if they would fit. He pulled the tooth out, and I always took it for granted after that that all dentists were liars, and believed it for twenty years. I did not think a man could be a dentist and be a truthful and decent man.—*Items of Interest.*

DR. C. W. HEISE claims to have used pental for the painless extraction of teeth with positive success.

DR. CROUSE'S method of treating alveolar abscess is as follows: Prepare your cavity; it is not necessary to give the details, except that care must be taken not to force the broach into the pulp canal, or get the cavity clogged with foreign matter; take a piece of soft India-rubber, cut it as near the size and shape of the cavity as you can; fill the cavity with carbolic acid, place the India-rubber into the cavity, and with it force the carbolic acid out through the fistulous opening. This is readily done with a blunt instrument and sudden

force against the rubber, such force as is used in packing gold by hand pressure. In my hands this has been the most effectual way of accomplishing the treatment. One such treatment is generally sufficient.—*Ibid.*

Women Dentists.

It is the intention of *The Dental Tribune* to devote considerable attention to the interests of women dentists. Probably few men are fully cognizant of the interest taken by women in our profession : from a list, which is as perfect as it can be made, but which by no means is complete, we find the number of women dentists in the United States to be as follows:

California	6	Montana	3
Colorado	4	Michigan	6
Connecticut	2	Mississippi	1
District of Columbia	3	Missouri	3
Florida	1	New York	10
Georgia	1	New Jersey	3
Illinois	17	Ohio	6
Iowa	4	Pennsylvania	30
Indiana	5	Rhode Island	2
Kansas	13	South Dakota	1
Kentucky	1	Texas	6
Minnesota	3	Utah	1
Massachusetts	2	Wisconsin	5
Maryland	1		

It has been the custom of dentists to recommend and give phosphate of lime and phosphate food in general, with the idea of supplying that which was wanting—the lime salts in the teeth. You may pack such children in a lime barrel; you can feed them on lime stew and lime hash without effect, for their teeth will not take up a particle more. The lime has to be introduced through the proper channels and in proper form. The digestive department is just as full of red tape as that of any Government. All its supplies have to go in a regulated course, without which they are not accepted.—Prof. Mayr, in *Items of Interest.*

Dr. Pierce claims to have had good results in the treatment of pyorrhea alveolaris with the following preparation: "I take," he says, "aristol in a wide-mouthed bottle and put in equal quantities of

tincture of iodine, oil of gaultheria, oil of cinnamon, and carbolic acid. It is not gummy: the iodine cuts it and makes it creamy, so that it can be readily used, and it remains without change for days or weeks." This he puts down in the pockets with a small spatula.

To MAKE plaster set hard, the *American Druggist* says: "Mix best plaster of Paris with about one-tenth (according to effect ascertained by preliminary experiment) of very finely powdered marble dust (calcium carbonate), or add to it about six per cent. of powdered alum, or about the same amount of ammonium chlorid, before mixing with water."

A YOUNG dentist recently returned from a prospecting tour at Rio de Janeiro, says: "That in that city of 300,000 inhabitants it is not unusual for a dentist to receive fabulous fees. That the time to visit Rio de Janeiro is during our summer, which is their winter; that the desirable patients for the dentist are the families of the farmers, who are as a rule the substantial monied people; that the inhabitants appreciate good dentistry and have good dentists; that they have a good dental college and that foreigners must pass a rigid examination in two languages before a State Board in order to practice; that it is not unusual to see the sign 'American Dentist.'"

To Mend Broken Objects of Cast Iron.

For this purpose, the following procedure is recommended as giving very satisfactory results: Take 2 ounces of sal ammoniac, 1 ounce of sublimed sulphur, and 1 pound of cast-iron filings; mix in a mortar and keep the powder perfectly dry. When it is to be used, mix it with twenty times its weight of clean iron filings, grind the whole in a mortar, wet with water until it becomes a paste, and apply to the parts to be mended. It will become after a time as strong and hard, it is said, as any part of the metal.

Why We Need Two Ears.

Sound travels by waves, radiating from a central point of disturbance, just as waves radiate when a stone is thrown into still water. So far as the hearing of each individual is concerned, these waves move in a direct line from the cause of the disturbance to the ear. This being the case, the impact is greatest in the ear nearest the sound. Now, a person who has totally lost the hearing of one ear cannot locate the direction of a noise to save his life, even when the center of

disturbance is quite near. Blind persons learn to estimate distance in a surprising brief period after losing their sight but experts on diseases of the ear say that persons wholly deaf in one ear can never learn the direction from which a sound comes.

To make glue water proof, dissolve of gum sandarac and mastic each five and one half drachms in one-half pint of alcohol, and add five and one half drachms of turpentine. Place the solution in a glue boiler over the fire and gradually stir into it an equal quantity of a strong hot solution of glue and isinglass; strain while hot through a cloth. Or to plain glue solution add bichromate of potash; on exposure to the air it becomes waterproof.

Novel Heat Motor.

Mr. Shelford Bidwell's heat engine depends for its action upon the fact that nickel is magnetic at ordinary temperatures, but at 300° C. becomes suddenly non-magnetic. A slip of nickel is attached to a disk of copper suspended by two strings, so that it can swing like a pendulum. On one side of the hanging metals is a magnet, with which the piece of nickel is ordinarily kept in contact, and held by it. By placing a gas flame or a spirit lamp underneath the nickel, so as to warm it, it becomes so heated as to lose its magnetism, or power of being magnetized, and falls off—the pendulum thus making a swing. By its passage through the air, the nickel is cooled below the critical point, and on returning is held again by the magnet, only to fall off again as before, and so on, with considerable regularity, so long as the source of heat is kept up.

Marriage of the Flowers.

Plants sometimes employ insects as their servants in the work of reproducing their species, paying them wages in honey. Most vegetables combine the two sexes into one flower; but breeding "in and in" is no more healthful for them than it is for animals. One blossom must marry with another if the species is to be continued in a healthy way. So young Mr. Honeysuckle dresses himself in a spring suit of light yellow and perfumes himself deliciously for the purpose of attracting the gay butterflies around. He also provides a small store of nectar in a golden cup to offer any insect guest that may come his way. Presently a butterfly pauses to take a sip of the sweet liquor, but in doing so she cannot avoid getting some of the pollen on her head, and this she carries to another honeysuckle,

where she stops for a second bit of refreshment, and incidentally rubs off some of the pollen upon its stigma. Thus is accomplished the marriage of the flowers.— *Washington Star.*

Silver Crystals.

A pretty microscopic view is the arborescent growth of silver crystals. Dissolve a small crystal of silver nitrate in a few drops of distilled water. Place a drop of this solution in the center of a slip of glass, and arrange it under a low power, concentrating the light from above by means of a condensing lens. Now take a piece of copper wire an inch and a half long, bend it like the letter L, and bend the longer limb in the form of a hook, which will rest anchor fashion when laid down. Place this at the side of the drop of solution, allowing the hook to dip into it at the edge. Chemical action results, copper going into solution and silver crystallizing out.

Gutta-Percha Solvent.

It is not generally known that *Cajaput Oil* is a good solvent of gutta-percha; it has, however, some disadvantages which may be overcome by using the following formula, which will be found very useful:

Cajaput Oil,
Chloroform aa
Gutta percha, q. s.

This will be found effective for lining cavities and smearing root canals.

Disinfection of Dental Instruments.

There is no department in surgery, writes Dr. Miller, of Berlin, in which the demand for antiseptic procedure is more urgent than in dentistry, for the reason that all the operations are performed upon septic or infected tissues and there are no means of rendering the territory to be operated upon aseptic except by the use of antiseptics of the highest character. The necessity of absolute cleanliness on the part of the dentist, of his hands as well as his instruments, diapers, drinking glasses, rubber dam, in short, everything which comes in contact with the patient's mouth, is universally recognized and yet it is not difficult to find persons engaged in the practice of dentistry who neglect this matter to an extent that is revolting to the taste and dangerous to the health.

In regard to the possibility of transmission of disease, such as

pyæmia or syphilis, by dental instruments, there have been so many cases recorded in dental and medical journals that the matter should be familiar to every practitioner of dentistry.

With reference to diapers, Dr. Miller found that boiling in water for ten minutes completely sterilized them, and no development of bacteria could be produced in agar agar. The rubber dam should be soaked in a 5 per cent. solution of carbolic acid for at least half an hour, or boiled for a few minutes, but preferably a new piece should be used for each case.

The ideal antiseptic for instruments is a liquid which acts immediately on bacteria without in any way injuring the instruments themselves.

There is a vast difference between sterilizing liquids, and sterilizing solid bodies, and an antiseptic which sterilizes a drop of water almost instantaneously may require a quarter of an hour to sterilize a solid body, particularly when it is coated with a layer of dried albuminous material, as dental instruments are liable to be. The length of time necessary to sterilize a body by a chemical agent depends greatly upon the character of the body, as well as upon the character of the matter with which it is coated. Porous bodies, as may be readily understood, are more difficult to sterilize than non-porous ones; also the drier and more insoluble the material with which the body is coated, and the more liable it is to form inert compounds with the antiseptic, the more difficult it will be to sterilize. It is consequently, above all things, desirable to employ the antiseptic in a form in which the infectious matter is soluble, and this in the vast majority of cases is in an aqueous solution.

Dr. Miller has performed about a thousand experiments, and gives in a tabular form the results obtained with the most noticeable agents. Of carbolic acid, he says, the impression exists amongst a great many that it is but necessary to dip the instrument in the solution for a fraction of a minute in order to render it completely sterile, but thorough sterilization with a 5 per cent. solution cannot be counted upon with moderate certainty in less than an hour, and a large burr, such as is used with the dental engine, after two hours' exposure was still found to contain living germs. Trichlorphenol gave slightly better results. Bichloride of mercury in a 5 per cent. aqueous solution was found to be by far the most prompt in its action of all the substances tested, but its powerful action upon the steel, interferes very seriously with its constant use for sterilizing instruments made of this material. Peroxide of hydrogen came next to

carbolic acid, but it was considerably inferior to it. The essential oils utterly failed to produce the desired action. Boiling water, especially when a 2 per cent. solution of carbonate of soda is added, is, in Dr. Miller's opinion, far superior to all other means of sterilizing; it will accomplish in two minutes as much as the chemical agents ordinarily used will in half an hour.

Silver.

Silver has always ranked next to gold among the common precious metals. Like gold it is a "noble" metal in that it does not oxidise when heated in the air; and although it forms more stable compounds with other elements than gold, yet it is readily reduced to the metallic state by comparatively weak reducing agents. * *

Silver is found native, or in the metallic state, in both crystalline and arborescent forms. It also occurs amalgamated with mercury, and as chloride and sulphide. In most cases, however, the silver occurs as a sulphide, in connection with much larger proportions of the sulphides of lead, antimony, or iron. Galena, or sulphide of lead, a very common mineral, usually contains varying proportions of silver, and the ores of copper often contain enough of the more precious metal to pay for its separation. The extraction of silver from its ores requires long and rather complicated processes; but, on a large scale, it can be accomplished very cheaply, and a comparatively poor ore will pay for its working. There are many old mines in Mexico and the West of which the refuse left by the ancient miners can be worked over at a profit.

Unlike gold, which always occurs in the metallic state, the ores ot silver are not readily recognized or worked by savage or semi-civilized peoples, and it has occasionally happened that among such peoples silver has been valued higher than gold; but the usual ratio between the price of silver and gold of about 1 to 20 has obtained more or less constantly for many years.

Silver is the best conductor of heat and electricity known, slightly exceeding copper in this respect. The physical and chemical relations between these two metals are very close in many other ways, and if the "transmutation of the elements" is ever accomplished—a very unlikely matter, by the way—we may expect that these two metals will be shown to be at least brothers in the chemical family.

The easy reduction of salts of silver to the metallic state renders it particularly adapted for electro-plating. Formerly the plating of cheaper metals by silver was accomplished by amalgamation with

mercury, or other chemical means, but these processes have been almost entirely superseded by the use of the electric current, which rapidly decomposes a solution of cyanide of silver, and deposits a bright and perfect coating of the metal upon articles immersed in it.

Silvering upon glass is effected by means of certain organic substances which have the power of precipitating silver from its solutions. When a solution of oxide of silver in ammonia is gently heated with Rochelle salts, glucose, glycerin or tartaric acid, in a clean glass or porcelain vessel, a bright coating of metallic silver is deposited on the sides. Glass door-knobs, small mirrors, lantern reflectors, and ornamental glass globes sometimes placed in gardens and parks, are silvered in this way, as well as mirrors used in certain reflecting telescopes.

Although silver has but little affinity for oxygen, it unites with the allied element, sulphur, more readily than any other metal. The "tarnish" which articles of silver take on when exposed to the air is due to the formation of a thin film of sulphide, from the traces of sulphur compounds usually present in the air. The discoloration of a silver spoon with which an egg has been eaten, is a familiar example and has led to the manufacture by enterprising jewellers of platinum egg spoons, which are unaffected by the sulphur compounds present in this popular breakfast dish. Every one who has carried matches and silver coins in the same pocket must also have noticed this undesirable combination.

The most remarkable chemical property of silver, however, is found in its relation to light. It does not stand alone in this respect, for compounds of iron, chromium, and many other substances have their composition modified by this mysterious form of energy of the light beam; but silver is pre eminent in this respect, and the wonderful change which is caused by this means in a film of chloride, bromide, or iodide of silver is the basis of the most beautiful modern art of photography. Many years ago it was noticed that chloride of silver blackened when exposed to the sun's rays, and from this simple observation the labors of Daguerre, Niepce, Draper, and their many successors have led to the present remarkable development of an art which produces pictures superior to the works of the best artists, at a nominal price, and by a process so simple that it is successfully practiced by thousands of amateurs, with no especial scientific knowledge, as a recreation and amusement.

This action of light upon certain salts of silver is especially remarkable as showing the connection between matter and energy, or,

more strictly, between those forms of energy known as chemical affinity and actinism. The molecules of bromide of silver in the sensitive film are held together by some attractive force which we know little about, but call chemical affinity. Something—some force or energy—comes to us in the sunbeam which enters into these molecules and forces them apart, into other combinations; but just what it is or how it is accomplished is something which we cannot explain. In the case of the element selenium, its electrical relations are similarly modified by the disturbing influence of the solar radiant energy, thus showing an intimate connection between them; and, although it has long been known that light, heat, power, actinism, electricity, and chemical affinity were but different manifestations of a single form of energy, the results of modern investigations tend to show that the connection between them is much closer than has ever been suspected, and that we are, perhaps, on the eve of discoveries in regard to the nature and properties of matter and energy which will revolutionize the theories formulated from the facts at present known to us.—*Popular Science News.*

Camphoid.

William Martindale says: It is known that iodoform is soluble (1 in 10) in Rubini's solution of camphor, composed of equal parts by weight of camphor and dilute alcohol. This requires fixing on the part to which it is applied. I therefore add 1 part of pyroxylin to 40 of the solution, and found it dissolved readily. Applied to the skin this preparation dries in a few minutes and forms an elastic opaque film, which does not wash off. The excess of camphor seems to volatilize, and as it disguises the odor of the iodoform its solution forms a useful vehicle for applying this drug. Pyroxylin dissolves readily in the simple solution of camphor, and this forms a cleanly basis for the application of many medicaments to the skin, such as carbolic acid, salicylic acid, resorcin, iodine, chrysarobin, and ichthyol. I suggest the name "camphoid" for the simple pyroxylin solution.

Formula for Insect Bites.

One of the very best applications for the bites of mosquitoes and fleas, also for other eruptions attended with intense itchings, is: Menthol in alcohol, one part to ten. This is very cooling and immediately effectual. It is also an excellent lotion for application to the forehead and temples in headache, often at once subduing the same.—*Weekly Med. Review.*

THE

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INTERSTITIAL GROWTH.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

Read before the Pennsylvania Association of Dental Surgeons.

There has appeared in the *Ohio Journal of Dental Science* for April, 1892, an extract from the *Dental Cosmos*, under the caption, "It Grew and it Grew," by Dr. A P Johnstone, and another in the same journal for April, 18?3, entitled, "Do the Teeth Grow?" by E. H. Raffensperger, D.D.S., Marion, Ohio, both to the same import *

I can testify to the following: Captain J. B. was a patient of Dr. J. B. Patrick, of Charleston, S. C., and was in the habit of seeking the services of Dr. Patrick from time to time. A decay occurring on the labial face of one of his upper central incisors, near the gum margin, it was filled. As years went by, Captain Blake continued to present for such work as his teeth stood in need, but in these visits no note was taken of the migration of the filling. When I saw the filling it occupied a spot about one-eighth of an inch from the gum margin. The war coming on, Captain J. B. entered the Confederate army, so that when he next presented to Dr. Patrick for services five years had elapsed. Dr. Patrick, who had made a record of the location of the filling, after Captain J. B. had brought to his attention that the filling did not occupy then the same place it did when it was first inserted, was surprised to find it now located near the cutting-edge of the tooth, and, if I remember correctly, called my attention to its then present location, I being at his office at the time. A few years afterwards the filling came out, having gotten so near the cutting-edge that there was no longer any tooth tissue to retain it in place.

This was not a case of grinding away of the teeth, but evidently one of growth. The teeth were very large central incisors, and he had a considerable overbite, which would have prevented the grinding

*See these articles in this number on page 99; also Dr. J. B. Patrick's paper in this number on page 100.

away of the cutting-edges, so that the filling migrated fully one-fourth of an inch from the place where it was originally inserted in fifteen or eighteen years.

Dr. Patrick reported the case in a paper which he read, I think, before the Southern Dental Association, and wrote me at the time, to substantiate his statement, as I was conversant with as well as witness of the case, I having moved from Charleston to Philadelphia.

About this time—September, 1881,—I had a case of a young miss, who was coming to me for dental treatment, and as she had a small decay on the labial face of the right upper central incisor, and as the case I had been in correspondence with Dr. Patrick was something out of the ordinary, after I had filled the tooth, I took an impression of the front teeth, and from it made a plaster model and on the model I marked the exact location of the filling, wishing to verify or to see if the same thing would occur in my case. Besides this, I marked on the diagram of my dental ledger the location of the filling also.

In the twelve years which have elapsed since this filling was inserted, the model I made has been lost, but the diagram *I have*, which still bears testimony of the location of the filling when it was inserted. This afternoon—April 19, 1893,—I called on the party (Miss E. S.), who is now no longer a little girl, but a grown young lady, and made the request to let me examine the filling. The filling was there as bright as ever, *but no longer in the same locality.* When I inserted it, it was at the point designated by A, in Fig. 1; now it occupies a position designated by B. During the twelve years which have intervened, it has grown nearer the cutting-edge an eighth or perhaps three-sixteenths of an inch.

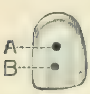

FIG. 1.

Besides the case related above, I recall another case—of Miss E. T. In this case a right upper cuspid was filled on the 21st of December, 1877, on its labial surface towards its mesial edge, and at this date—May 15, 1893,—the filling occupies a position *at its cutting-edge* (shown by Fig. 2), almost ready to be expelled—as doubtless it will be a few years hence. In this case the lady had unusually large teeth, with a very considerable overbite. There is none of that cupping at the point of the cuspid which we see when the teeth are brought edge to edge in the act of chewing, so there is no wear on the tooth at its cutting-edge to account for the change of position in the original location of the filling.


FIG. 2.

This leads me to believe that the cases of interstitial growth are

not so rare as we might suppose, and that they may be verified by dentists taking the trouble to locate their position on models made at the time of insertion and of noting their locality after the lapse of a certain number of years. Or, if they do not care to go to the trouble of taking an impression and making a model, a better plan may be adopted as follows: In the advertising pages of dental journals may be found cuts of block section teeth for rubber work (as shown by Fig. 3, published by all dental dealers). One of these may be selected

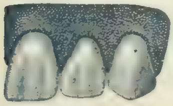
FIG. 3.

corresponding in size and shape to the tooth that has been filled. The engraving may be cut from the page and the exact locality of the filling marked on it. This may then be pasted in the dental ledger at the account and page of the patient, and will serve as a perpetual reminder and is less liable to be lost than a plaster model.*

DO THE TEETH GROW (?)

BY E. H. RAFFENSPERGER, D. D. S., MARION, OHIO.

This may sound rather an absurd question for a dentist to ask, but after reading the facts others may ask the same thing.

About ten years ago a lady called my attention to a peculiar yellow spot in the enamel of one of her central incisors, superior, on the labial surface. The spot was about the size of a pin head, and situated about one-third the distance between the gum and the cutting-edge of the tooth. Nothing was done and the case forgotten. at the time. A few weeks ago the lady called my attention again to the same spot, and I was greatly surprised and dumbfounded to see the spot now exactly at the cutting-edge of the tooth. Nor was the cutting-edge in any way worn down, but as sharp as ever, hence the query at the head of this. Do the teeth grow like the finger nails? This case naturally suggests the idea. I have simply given the facts and you can draw your own conclusions. Will say, however, that the spot was "cut out" and filled, and I shall now watch the case to see whether the filling will eventually work its way over the cutting-edge of the tooth and up on the lingual surface. Perhaps, after all, there may be something in the "sun do move" theory.

"IT GREW AND IT GREW."

Dr. A. P. Johnstone has in mind a case where a filling was inserted midway between the cutting-edge and the gum-margin of a tooth, and the gentleman in whose mouth it is, is under the impression that that

*Discussion on this paper will be found in the next "Report of the Pennsylvania Association of Dental Surgeons."

filling is constantly getting toward the end of the tooth. Whatever the change is, it has been going on for fifteen years, and the filling is now nearly to the point of the cutting-edge. Like causes will produce like results when acting under similar circumstances. If we can get at the cause of a given result, we have some right to hope to again produce that result; so that if the teeth do grow, it is a fact of the utmost importance to us.—*Sou. So. Report, Cosmos.*

SINGULAR EXHIBITION OF INTERSTITIAL GROWTH IN TEETH.

BY J. B. PATRICK, M. D. S., CHARLESTON, S. C.

We propose to engage the attention of the Association for a few moments in rehearsing the particulars of two singular observations made by myself and son, apparently so rare that we have not met with any similar instance in the annals of dental science. They deserve to be placed on record as they seem to contravene what is so well known of the development and nature of the several substances of a tooth, and are aptly fitted to open a discussion as interesting as instructive in the explanatory interpretations they suggest.

The first occurred in my practice some time since; the other came to my son's knowledge recently during his sojourn and practice in Beaufort, S. C., and has been carefully substantiated by most reliable authority.

CASE 1.—Some time since Mr. J. B., a well known merchant of Charleston, S. C., had the superior left central incisor filled directly upon its anterior surface a little beneath the neck of the tooth; the filling was of gold. About three years after he called to show me, that the plug, while still firm and in place, had, to use his own expression, "grown down upon the surface," receding from the gum and therefore more visible whenever the lip was raised in smiling or in speech.

He was informed that a tooth could not grow, and as I had no recollection of the original position of the filling whereby to verify the accuracy of the statement, and believing that the patient was mistaken, a diagramatic outline of the tooth was made, and the actual position of the plug carefully indicated. He was requested to call again in the course of time that we might witness so singular a phenomenon. Upon subsequent examination of this tooth a few years after, we were indeed surprised to find that there had been an obvious change of position of the plug to about a line below the point indicated and accurately fixed by admeasurement in the drawing, and singular to state there was no wearing away or attrition of the free

border or cutting edge of the tooth ; it proved to be a real and not an apparent alteration of position. A fact so clearly established, and yet so difficult to explain, could not but arrest attention, and the necessary inference was, that, should such a phenomenon continue to be repeated the filling would ultimately come to occupy the absolute edge of the tooth, and grow out of it altogether. We are here to relate, that in due time, this event really took place, as the progression continued until the gold fell out, and no trace of the operation remained but a slight indenture along the cutting edge of tooth.

Case 2.—While in Beaufort, my son as already stated, became informed of the particulars of the only other instance of the kind of which I have any knowledge, as it rests upon the authority of her parent's statement, I am permitted to make use of the name and the details which a letter addressed to him on the subject contains. The young lady to whom this case refers is a daughter of Commodore T. P., of the U. S. Navy, and as the letter in question contains briefly all that is necessary to be known, I transcribe it, as the best account I can furnish.

U. S. Naval Station, Port Royal, S C., April 12th, 1880.

Sir :—When my daughter was about eleven years of age, she had a front tooth filled by Dr. Northall, a partner of Dr. Foster, of New York city, the filling was of gold and close up to the gum, in the course of ten or twelve years the tooth had grown down until the filling was on the edge of the tooth.

Respectfully, your obt. serv.,

T. P., Commodore U. S. N., Comdg. Naval Station.

Dr. J. B. Patrick, Jr., Sea Island Hotel, Beaufort, S. C.

In attempting to account for such exceptional phenomenon as occasionally present themselves, who shall limit the possibilities of that consummate workmanship of cells in the mysterious operations of repair! The difficulties in the instance of a tooth, however, and the inexplicable difficulty here presented, is the *inorganic* character of its structure. Were the teeth bones, traversed by blood vessels, nerves, and lymphatics ; in other words were the teeth highly organized ; molecular depositions of new dentine would at once not only explain, but would actually foreshadow what might naturally ensue, where a metalic substance like gold was embedded in the tissue. But it is wholly otherwise with dentine. Though organic in its origin it is not in the human subject organizes therefore neither grows, inflames, nor undergoes repair ; and whether burnt, bored, broken or filed away, is never reproduced. Yet it is just here, that we would observe that little if anything is known of the history of the human dentine in its abnormal state. There are no less than four distinct

modifications of this tooth substance recognized. The researches of Professor Richard Owen on this subject have demonstrated that throughout the various classes of mammals, it presents itself more or less organized so far as a supply of capillary vessels would indicate; so distinct in its microscopic appearance that he has designated this as constituting what he terms unvascular dentine, vaso-dentine, vitro dentine and osteo dentine.

Now, to what extent the human dentine may become abnormally modified within perfectly healthy conditions, we know literally nothing. This entire field of research appears open to future investigation. It is most true that none other than convascular dentine is supposed ever to exist in man; yet theorically there is no reason why some of these modifications of structure may not be found reproduced in the human species; especially such as we know to obtain at an early period of the sucular stage of the human tooth's development. Why, for example, under very extraordinary and peculiar circumstances may not some few of the capillary tracts of the formative vascular pulp remain uncalcified, perpetuating in the subsequent permanent tooth the embryonal stage of a vaso—dentine tissue? Here, in a limited area of such a tooth's substance, it would continue to receive a far more active supply of nutriment than belongs to the simple tubular dentine. Under such a condition molecular changes of an interstitial nature would constitute a very slow growth, similar in kind though very different in degree, to that which is well known to occur in the scalpriform incisors of rodentia; with this difference again that in the rodent the tooth grows as a whole from the base, whereas in the case theorically suggested a segregated tract of interstitial molecules would alone undergo growth, and the progressive displacement of a foreign body like a plug of gold would continue to advance until this was entirely expelled.

Again, another suggestion occurs to us, which, borrowed from the embryonic history of a tooth, may perhaps better comport with the known tubular character of the tooth substance in man.

It must be remembered that at a very early period of its evolution, the crown as well as the fangs of a tooth is surrounded or covered by a thin layer of cement—crusta perrosa—*the part of all others which most resembles bone in structure. It is possible, that should such a layer of cement continue *abnormally* to invest the crown of a tooth in any appreciable quantity, that the presence in this layer of a foreign

*Richard Owens' article, "Teeth," Cyclopedia of Anatomy and Physiology, vol. iv, p. 867.

particle of gold might excite a somewhat active reproduction of the tissue in its neighborhood, which growing as we know the cement to do with great readiness would produce, in like manner the phenomenon which we have been commenting upon.

Such, then, are the hypothetical speculations which these interesting and rare observations have suggested, and they are offered as the only two modes of accounting for the possibility of such exceptional instances. The interest I have myself felt in this subject is my apology for so long a trespass upon your attention.

[THROUGH the courtesy of the International Dental Publication Company, we are enabled to present our readers with the following article.—ED,]

TWISTED WIRE FOR REGULATING TEETH.

BY WILLIAM SLOCUM DAVENPORT, D. D. S., PARIS, FRANCE.

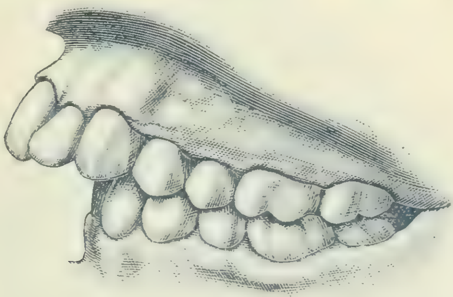

FIG. 1.

Fig. 1 represents the mouth of a young lady, seventeen to eighteen years of age.

The superior teeth articulate with those of the lower jaw,—one cusp is too far forward, and the inferior front teeth are flattened backward, while their cutting-edges arch upward until the incisors nearly touch the palate.

The bicuspid region in the lower arch is broad enough to conform to, and permit the teeth to articulate with, those of the upper jaw.

The vault is very high.

The upper lip covers about one-fourth the upper teeth, and the lower lip falls far back and under the superior incisors.

In the history of the case we find,—

1. The patient, until four years old, had the habit of sucking her thumb, with its palm side placed against the roof of the mouth.

2. She was a constant sufferer from adenoid growths and bronchitis, on account of which the tonsils had been incised at the twelfth year.

3. She was a mouth-breather.

4. No similar deformity could be found among any of her relatives

The first means employed towards correcting the irregularity was to push forward the lower incisors by the use of *linen tapes*, acting as wedges between these teeth and a corresponding edge of a plate which was fitted over the molars and bicuspids.

When this was accomplished, a simple rubber retaining-plate was inserted, and the patient left Paris for the winter.

It was my intention, upon the patient's return, to spread the upper arch and attempt to jump the bite, but it was finally deemed more practicable in the *present* case to draw the upper teeth backward, and, to obtain the necessary space, the two superior first bicuspids

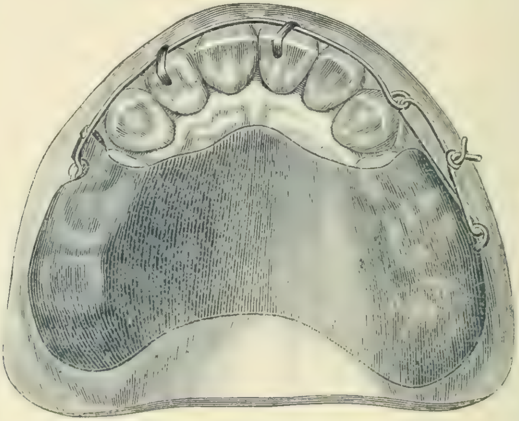

FIG. 2

were extracted. An appliance (Fig. 2) was then made, consisting of a rubber plate, which covered the upper back teeth. Into the right side of the plate was vulcanized one end of a half-round platinum wire, which was passed around in front of the incisors and terminated in a loop at the free end. Two little hooks were soldered to the front of the band in such a way as to catch over the ends of the centrals when the plate was in the mouth, and prevent the wire slipping up against the gums. Into the left side of the plate a staple was vulcanized.

When the plate was in position a copper wire was passed through both the loop and staple, and had its ends brought together and

twisted, this producing pressure upon the centrals, laterals, and cuspids.

From time to time another twist was given to the copper wire, until, at the end of seven weeks, the teeth were in the desired position.

A retaining fixture was then placed, consisting of a strip of pure gold, No 5 to 6 Stubbs, and French gauge, so bent and soldered as to form a loop at each end

Having previously separated the teeth with linen tapes, the looped strips were covered inside with thick chlora-percha and passed around the anchor-teeth, allowing the loops to be on the outer sides.

Copper wire was passed through these loops, and the ends of the wires were brought together and twisted (Fig. 3) until the pure gold bands were perfectly swedged to the convexity of the crowns, forcing the superfluous chlora-percha out at all points and making an accurate fit. (These bands did not move until taken off four months later.)

FIG 3.

Copper wires were fastened to the loops left in the band at the buccal surfaces of the teeth, and brought around the front teeth from both sides and twisted together at the centrals. This drew the six front teeth to their exact places. The twisted ends were then bent over the cutting-edges of the centrals, to protect the gums from the wire. All rough places at the sides were then covered with gutta-percha.

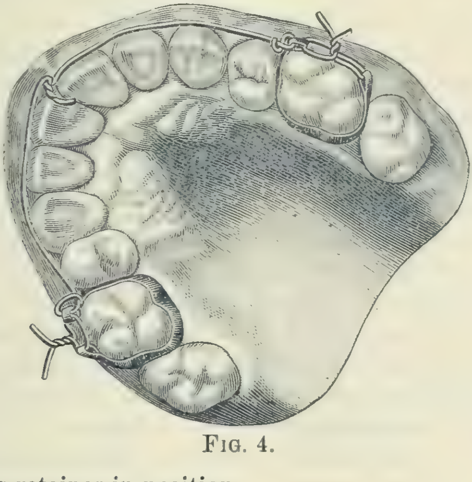

FIG. 4.

Fig. 4 shows retainer in position.

By comparing Fig. 5 with Fig. 1, we find the six front teeth were drawn directly backward.

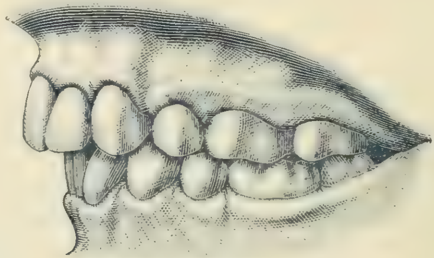

FIG. 5.

The patient was instructed to remove the plate while eating, and by so doing a very good articulation at the finish was secured.

Positive and intermittent force is secured by such a use of twisted wires as above indicated. The principle involved is that of the inclined plane, which is also the principle made use of in the screw.

Appliances dependent upon twisted wire for the application of force are easily made and applied, and possess many obvious advantages over the screw in very many cases. Wire of silver, galvanized iron, or copper, owing to their pliability, strength and cheapness, will be found very satisfactory.

A NEW AND VALUABLE METHOD OF TREATING DENTAL ABSCESSES.

BY R. OTTOLENGUI, M. D. S.

In my opinion, Caustic Pyrozone will very shortly be considered one of the most valuable topical drugs in the medicine cabinet of the dentist. From my experience with it in a number of cases, I am satisfied that for several purposes it supersedes anything previously at our command. Its chief employment of course must be upon pus generating surfaces or tissues. Of these it will be more welcome in the pockets of Pyorrhœa Alveolaris than in abscesses, or other pus yielding diseases, though useful in all.

Its most marked and valuable characteristic is its affinity for pus. Brought into contact with it, there results a bubbling and rushing forth of the pus which will astonish those who see it for the first time. We are often led to suppose that Pyorrhœa has not yet attacked a specified tooth, because pressure will not force an escape of pus around the neck. I am satisfied now that many such seemingly healthy individuals, in diseased mouths, are affected, for I have been amazed to

observe the free flow of pus in such cases, immediately upon the application of Caustic Pyrozone. I think I can best describe the manner of using this drug, by giving the record of a few cases.

Case 1.—Chronic Pyorrhœa Alveolaris. Patient a man ætat 35. In good general health. Using tobacco freely to chew and to smoke. Calcareous deposits upon the inferior teeth, mainly upon the lingual surfaces. Some deposits upon the superior teeth. Gums of both jaws much inflamed, bleeding upon the slightest touch. Pus oozing around necks of all teeth save the six anterior superior. Disease in its most advanced form around the wisdom teeth, about which the processes had been almost entirely lost. Patient suffering almost constant pain, though with the exception of the wisdom teeth none were loose, the pockets all being quite shallow.

Treatment.—Calcareous deposits removed as far as possible, resulting in copious hemorrhage. Because of the severe bleeding, I decided to treat with Pyrozone at the first sitting, only the six anterior superior teeth, which were least affected, no tartar being about them. This latter fact rendered scraping with instruments avoidable, and these teeth were therefore the only ones about which no hemorrhage had been occasioned. A small pledget of cotton, rope-shaped, was moistened with the Caustic Pyrozone, and with a probe introduced between the cuspid and lateral, being pressed up under the gum margin as far as possible. There it was left until the appearance of foam indicated that pus had been found. This was perhaps from five to eight seconds. It was then withdrawn and immediately there was a considerable discharge of boiling pus, finally escaping tinged with blood. The same treatment repeated about the others of the six teeth selected brought forth a foaming mass which covered the adjacent parts as with a thick lather. The mouth was then rinsed with warm water and the patient dismissed for four days. At second visit, so great a change had occurred, that an application of the agent about the same teeth produced scarcely a perceptible escape of pus save in one pocket. The gums were remarkably improved in tone, inflammation having almost entirely disappeared. The patient reported that the night after treatment was the most comfortable passed in months. At this visit the six anterior inferior teeth were treated similarly, and the treatment repeated four days later, by which time they had so far advanced towards recovery, that I proceeded to take up the posterior teeth. I would call attention to the fact that I deem it wiser not to treat too many teeth in one mouth at the same sitting. It will be better to take those first which cause the most suffering,

and make an application to them only. In this case by the fifth visit the caustic treatment was abandoned, all pus having disappeared. The mouth is recovering rapidly under occasional dressings of an astringent nature, Medicinal Pyrozone being used as a mouth wash. All pain has been controlled, and the teeth can be brushed without bleeding of the gums. I do not consider that this is a permanent cure, but it is the most rapid recovery to a condition of good health that I have ever seen.

CASE 2.—Pyorrhœa Alveolaris complicated with Alveolar Abscess. Patient a woman of 40. Presented in great pain occasioned by a well defined abscess about an inferior cuspid. This was one of those rare cases where an abscess is present despite the fact that the pulp is alive. The pocket was not very deep, and other teeth were involved in the general disease, but I shall confine myself to this special condition. The gum at the lingual aspect was much swelled and the discharge of pus copious. I cleansed the pocket by manipulation with the finger and by syringing with warm water, until it appeared quite clean. I also packed the pocket with absorbent cotton, wiping pus from the soft tissues in this manner. I then as in the above cases inserted Caustic Pyrozone on a bit of cotton, passing same down into the pocket. In a couple of seconds the foaming was observed, and I removed the cotton. Immediately there issued forth a foaming discharge which completely hid all the neighboring teeth. At the second visit the patient reported that the pain had been greatly relieved, and I renewed the treatment, there being yet a free discharge of pus. Contrary to instructions, the patient remained away from the office for a week and returned in pain, and with large quantities of pus escaping. I became satisfied that there must be some special cause for this condition, and after a more thorough exploration, decided that there was caries of the alveolus about the tooth, especially involving the septum between it and its neighbor. With the engine bur I operated, removing the dead bone freely. I then treated with the Caustic Pyrozone, and with a second application two days later reached a point where the tooth was as well as its neighbors, reducing it and them to a stage where they will be easily controlled. Pain, inflammation and pus, have all disappeared.

CASE 3.—Abscess without fistula. Patient presented with aching tooth. Removed old filling and found a putrescent pulp. Symptoms indicated that pus might be present about the apex of the root, but there was no fistula, and no sign of one forming. Neither was there any discharge through the root. I dressed the canal with cotton

slightly dampened with Caustic Pyrozone, and left it in for one minute. Upon withdrawal was somewhat surprised to see the amount of clear yellow pus which followed. In this case I think that the wonderful affinity of Pyrozone for pus caused its passage through the foramen, and once having passed that point, it continued to discharge itself through this vent which offered.

From my experience in these and other similar cases I may offer a few suggestions to those who essay to use this drug. The first caution is as to quantity. A little will do all the good possible, whilst more will be harmful. The application is painful, producing what the patient will call a burning sensation. It will, however, be less painful applied to diseased surfaces than if placed upon healthy tissues. For this reason and because the cauterizing of the healthy parts is undesirable, care should be taken that the cotton rope or tampon is not so saturated that when pressed into the pocket or fistula, the excess will be forced out and escape upon other parts than those that are generating pus. If this should occur, pain will follow which may be quickly relieved by rubbing freely with tannin and glycerin.

Another objection to permitting the agent to reach the healthy surface of the gum is that it will produce an ugly white stain. Whether this is a true eschar or not, I am in doubt. The eschar caused by carbolic acid, salicylic acid, and other escharotics, results in the death and exfoliation of the surface of the soft tissues. This does not seem to occur with Pyrozone. I accidentally spilled some upon my fingers and afterwards washed my hands, whereupon within a few moments their appeared a chalkly-white stain, quite ugly in appearance. I feared that there would be a slough and a sore finger, but to my utter astonishment, when I reached home, it had entirely disappeared, the cuticle being as perfect as though no caustic had reached it. This led me to some experiments, the result of which I will state. Immediately after placing a drop of Caustic Pyrozone upon the finger, a rapid evaporation is visible, with a sensation of burning. If the cuticle is broken the pain will be greater. If left untouched, in about twenty minutes a whitish stain will begin to appear, increasing slightly till in half an hour it is distinctly visible. This stain will slowly disappear, vanishing entirely in three hours without medication of any kind. If however, an effort is made to wash the caustic from the fingers, the stain will appear within ten minutes thereafter, and will be of intense whiteness and very conspicuous. The cuticle may be scraped off and the stain will be found not to have penetrated beyond, but this cuticle will be seen by the magnifying glass to be thoroughly

stained throughout. Nevertheless if undisturbed, this stain, though deeper than that found when water had not reached the part, will all disappear within from three to four hours. If gloves are worn on the hands placed in the pocket, the stains pass away within one hour.

The deduction from this is that any excess of Pyrozone should be removed with bibulous paper, and the application of water avoided. I think that the water simply softens the surface of the tissues allowing a deeper penetration.—*New York Medical Abstract.*

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

Reported by Theodore F. Chupein.

The secretary read a communication from the chairman of the committee on State and Local organizations of the American Dental Association which contained ten subjects, on which discussions were solicited, both with the view of stirring up an interest in all organizations, as well as to obtain the views of the members of such organizations on the questions proposed.

D. W. H. Trueman, while he did not consider the questions proposed were of such moment to the dental profession (except question No. 10) moved that the president appoint three members to take one question each, and to prepare a short paper expressing his views thereon and report at the next meeting.

Dr. Chupein spoke of the success he had had in the use of "Small's Dentine Obtunder" for excavating sensitive dentine without pain. He was disposed at first to attribute its action to dehydration, but on experimenting with the hot air syringe for the same purpose he was forced to believe that the obtunding effect was due to the hot chloroform vapor which was used with the instrument. In at least 30 cases where he had used the instrument the patients reported a total absence of pain, where before its use the pain was almost unbearable, while only 2 reported adversely. He admitted it took time to apply, but this he was disposed to give if the result was efficacious.

Dr. Trueman had seen the instrument, but did not think it was worth the ten dollars they charged for it. He did not know of its efficacy and was still wedded to sharp excavators to overcome the sensitiveness of dentine. He thought it might be an excellent aid as a root filler, because if a small amount of gutta percha were put in the root, and this hot vapor of chloroform blown upon it, the gum could be kept in such a softened condition at the operator's pleasure, that the root could be readily filled up to its apex by means of this and suitable root fillers. He was more disposed to favor Dr. Darby's

plan of compressed hot air for obtunding sensitive dentine, although the plan he thought was originally suggested by Dr. Register and the credit of it due to him, rather than to vaporized chloroform.

He spoke of a splint which he had constructed to retain the three front teeth which had been accidently knocked out, which he had made of base plate gutta percha. After the teeth were inserted the gutta percha was softened and a strip laid over their labial faces, the teeth being supported by the finger on their palatal surfaces. When this hardened a similar strip was laid over the palatal surfaces. Holes were made through these plates with a hot instrument and the two plates united by ligatures passed through these holes at the necks of the teeth and tied with the knot suggested by the late Prof. Barker. This being done, the gutta percha was wiped dry and coated with a film of the oil of cajiput, when another strip was softened and laid over the knots. This presented a smooth surface to the lips, which would have been irritated by the knots. The splint worked very nicely and was worn with little discomfort by the patient, and the replaced teeth were held securely in place until a perfect union was established. He then read the following paper on the question which had been assigned to him, viz: "Should Dental Examining Boards be empowered to grant certificates of qualification to under graduates." The legitimate object, and the only legitimate object of Dental Legislation is to compel, on the part of those desiring to practice Dentistry, a proper and adequate educational preparation. The standard was, and still remains, a diploma from a reputable dental college. Recognizing that a new order of procedure could not be suddenly enforced without destructive friction, the early promoters of dental legislation, as a temporary expedient to bridge over that interval, which they foresaw must intervene before the educational advantages of a dental college course should become generally recognized, provided for a Board of Dental Examiners, who should be empowered to pass upon the qualification of those who were then preparing for practice under private tutors, or in other ways than by attendance upon a Dental College. It was recognized that in many cases, to immediately compel the abandonment of methods previously deemed sufficient and honestly entered upon, would be a hardship and an injustice. By requiring these home students to submit to an examination, as nearly as might be, corresponding to that required of a dental student, would work no hardships and be in full accord with the main object and intent of the dental law, which was first and last, that every practicing dentist should be a college graduate. The certificate of qualification which

they were empowered to grant, was a temporary expedient, and not intended to take the place of, or to be equal to a college diploma. It was confidently expected, that within a few years, the educational advantages of a college course would be so generally recognized by the student and the public, that applications for examination by the Board would cease. That expectation has been fulfilled, As was intended, it is now generally recognized that a diploma from a reputable dental college is and should be a perquisite for entering upon the practice of dentistry. The time for expedients has passed, and there exists no longer any excuse for permitting the State Examining Boards to grant degrees, or to issue certificates of qualification to non-graduates.

DISCUSSION.

Dr. Chupein did not think that this power should be vested in a Board. A Board of Examiners might question an applicant and find him qualified to practice dentistry, but such an examination carried no instruction or information with it. The applicant might answer the questions put to him, but he knew no more after the examination than he did before, whereas the college course and the College diploma was only granted after the student had gone through the curriculum, and had been examined by the whole faculty of the college. He thought the power vested in a Board of Dental Examiners, was derogatory to the advancement of dental education. It was rather hard on the student who had come, perhaps, from a distance, who had to put up with all the discomforts of college life away from home and its sweet influences, who not only paid his passage to the city where the college was located, but in addition to this his board and college fees—often at a great sacrifice of time and money, not for one but for two, and now for three sessions, giving not only his money but his time, that his mind and fingers could be so guided and instructed as to qualify him for his work, and after doing all this to learn, that a man, probably in his own town, had merely presented himself before the Examining Board, and with no study worth mentioning, no loss of time, no discomforts of leaving home but a few days, no considerable expenditure of money, passed and obtained a diploma or certificate of qualifications to practice. Cases of this kind are more apt to make men indifferent to attendance to college, and if this power is still continued it will tend to decrease rather than to increase the number of college students.

Dr. Roberts thought it might be well for the Examining Board to question the student or graduate, after he had obtained his diploma, which would be a check on some of the colleges which might be lax

in their examinations, and should the applicant fall short, to look into the standing of the college which had given a diploma to incompetent men, or had been lax in their curriculum.

Dr. Trueman held similar views, but he thought a diploma from a reputable dental college superior to that from any Dental Board of Examiners. He related two cases to show how a board might be deceived. The one was a case of a most intelligent man, who could express himself well, and to all appearances as far as talk went, was a splendid dentist, but whose operations at the chair as well as his work in the laboratory showed the most fearful lack of ability; while the other was wanting in everything that constituted book knowledge, to a most dreadful state of ignorance, whereas his work, both in the laboratory and at the chair, showed him a most finished workman. Should cases of these kinds present before a Board, it is needless to say which of the two would pass the examination, or which should obtain the diploma. The man who could answer well would be passed, while the other who could do the work but could not express himself, would be condemned. In both these cases a college training would have benefitted both; for the intelligent man would have had his fingers taught, while his ignorant brother's mind would also be improved and instructed.

Dr. Bonsall, to whom the second question was assigned, viz., "Should immediate root filling be practiced while purulent conditions exist at the apex," presented no paper but made a verbal report of his opinion and practice in such cases. He had always opposed such practice and never did or would fill such roots until all evidences of septic conditions had abated, and his answer to the question was an emphatic No!

All the members present expressed similar views, so that there was no marked difference of the manner of operating in cases of this kind.

Dr. Chupein presented his paper on the third question, viz., "What are the best materials to enter into the composition of temporary fillings, to be retained for a minimum of three years." A filling that would be called "temporary" would scarcely be expected, in our opinion, to last or preserve a tooth for three years. Temporary fillings are inserted to bridge over a time, during the vacations which dentists generally take during the fall of the year, when the closing of cases make it incumbent on those who have the care of teeth, to make provision against the liability of further decay during the interim; or to stop pain by the insertion of a filling only intended as a forerunner of a more thorough future operation.

The material which we have found best, to meet such cases as we have instanced, and others of a similar kind, are phosphate cement, red base plate gutta percha or other preparations of gutta-percha sold at the depots.

Of the phosphate cements there has been observed, in our practice considerable difference in different patients. With some it seems to preserve the teeth perfectly, only being subject to wear, while in others a disintegration goes on at the cervical margin, insiduously, which results in either the loss of the tooth, or in the character and location of the decay which is difficult to combat, since the new decay progresses above (or below) the gum margin, making it often impossible to properly prepare the margins or to apply the rubber dam. In such cases it would be risky if we had the patients interest at heart to permit such a filling to remain so long as three years.

With gutta percha this is not the case. It is a perfect tooth preserver. It may disintegrate and appear to be rotten, or it may bulge inordinately beyond the cavity, but even in these conditions it preserves the teeth. Its only fault is the cupping or wearing from the friction of mastication. It is rarely the case where a tooth has an antagonizer and the material subject to such attrition, that we can expect more than eighteen months or two years wear to a gutta-percha filling. Yet we have observed that though gutta-percha fillings in such exposed places may be worn to the thickness of a wafer, such remains of the material seems to be able to preserve the teeth from further decay for a long time. We do not think that we have any materials but these, that may be classed as temporary fillings. And we consider them, particularly gutta-percha, the best.

DISCUSSION.

The members present held opinions so similar to Dr. Chupein's that there would be nothing gained by a record of it.

Dr. Trueman proposed that we continue these questions in the manner they have been presented and empowered the Secretary to appoint essayists for the remaining questions proposed in Dr. Kirk's circular letter.

Dr. Trueman called attention to the early use of gold, copper and platinum as constituents of amalgam for filling teeth, as evidenced by the following paragraph found in "*Turning and Mechanical Manipulation*," by Chas. Holtzapffel, London, 1846, vol. 2nd, page 970. "Dentists employed an amalgam containing silver for stopping carious teeth; it is prepared by rubbing in a mortar, or even in the hollow of the hand, finely divided silver and mercury, and then squeezing out all the uncombined mercury, leaving a plastic mass. * * * *

"The usual mode of preparation is to dissolve the silver in nitric acid, and precipitate it as a fine metalic powder, by stirring the solution with a rod of zinc or iron. Some dentists file part of a shilling into dust, under the impression that the copper therein also employed makes the amalgam harder; others rub in with the silver a little gold leaf or platinum leaf with the same intention. Precipitated palladium forms with mercury a similar amalgam to that with silver, but with the evolution of heat at the time of combination. These alloys which have received various high sounding names, are seldom remelted, but then resume for some hours their plastic conditions."

In the same volume is noticed (page 955) a carving machine, patented by Mr. Tomes, March 3rd, 1845, for making artificial gums, teeth, and palates. This machine is said to carve, from hippopotamus or walrus ivory, a plate, that when carefully made fits so exactly to the surface of the mouth as even to exclude the air from between the model and the gums, and is therefore capable of being retained in position without springs, simply by atmospheric pressure.

There is also illustrated and described at pages 1003 and 1004 two drill stocks for use in the mouth, one on the Archimedean principle, invented by Mr. MacDowall, the other an ingenious modification of bow drill invented by Captain G. D. Davison. Both were designed to conveniently reach far back in the mouth, doing the work that is now done by the right angle, or back action hand-piece of the dental engine.

These are little historic scraps that probably are not noted in any dental publication. Holtzapffels' work is purely on mechanics, and yet I may safely say its careful study has assisted me more in working upon sensitive dentine than all that I have read upon it in dental publications. His remarks upon the principles involved in the construction of the cutting edges of tools, and their adaptation to various kinds of work and material, and his comments upon an exhaustive paper upon the subject by Chas. Babbage, are quite valuable, especially if the principles there laid down are experimentally studied with the assistance of a slide rest turning lathe.

Dr. Trueman also read from *The Parents' Dental Guide*, by Wm. Imrie, London, 1834, page 105, the following, that seemed to have historic interest: Of Gold Caps. "When the back teeth have become shortened and do not touch their opponents in the opposite jaw, one or more of them on each side of either jaw, as may be found most suitable and convenient, should be covered with *gold caps* (these italics are in the original). Indentations should be formed on the

grinding surface of the caps, to correspond with those of the teeth, and for this purpose they require to be raised on a brass model of the grinders, a process well known to dentists of ability and skill.

From the same cause, namely, the shortening of the molar teeth, the whole shock of the jaws, when brought into contact, is received by the front ones, which, by this incessant action, loosen, and one after another drop out of their sockets. When only a few molar teeth remain in the mouth, although they may be extensively decayed, it is essential to preserve them, for purpose of mastication, and also to prevent the front ones falling a sacrifice to undue pressure; for this purpose the decayed molars should be plugged, and afterwards restored to their original dimensions, by means of gold caps; this is an effectual way, and may be recommended to persons who have an antipathy to artificial teeth."

"In some cases it is necessary to lengthen the grinding surface of the back teeth, (although none have been extracted, but are worn away by a long course of attrition, through original defective organization), or the front ones will be lost." This he recommends to be done by adjusting gold caps and gives a case where this was satisfactorily performed. In another place he recommends gold caps upon a molar of each side to support a gold bar used in regulating, preferring this to ligatures. He quotes from Patterson Clark, author of "A new system of treating the human teeth." London, 1829-30. "The proper remedy when an undue pressure of the front teeth of one jaw is exerted against those of the other, is to cap the remaining teeth with gold."

The gold caps here referred to seem to be identical with those which are now so often used for like purposes, known as gold crowns or Richmond crowns. They were most likely made to fit tightly, accurate adaptation being depended upon to retain them in place, as no mention is made of any cement. In another portion of the work he speaks of protecting teeth by covering them with gold plate, swaged to fit over the surfaces exposed to wear, and retained in place by clasps, so we infer from this, and the description, that the caps were fitted to each individual tooth as we now make them. Mr. Imrie's book is more of a popular treatise than a text book; it is not illustrated, neither are operations treated in detail.

He gives a novel method of constructing a regulating appliance that even at this late day may be of use. A Miss, aged 10 years, presented with the upper central incisors closing within the arch.

To correct this, "an impression of the lower front teeth was taken

in wax, and modelled to an incline plane, resembling a wedge; this was covered on all sides with plaster of Paris, leaving a small opening at the top, through which the wax was removed (having been previously immersed in hot water), the plaster then became a perfect mould, which, being thoroughly dried and hardened, was completely filled with block tin. On breaking away the plaster, the tin was found to correspond precisely with the wax impression, and fitted the lower teeth with accuracy, maintaining its situation as firmly as a rock."

KIRK (E. C.) ON SODIUM PEROXIDE AS A BLEACHING AGENT AND ANTISEPTIC.

Sodium peroxide differs from hydrogen peroxide in the important particular of its relative amount of available bleaching oxygen which is stated to about twenty per cent., against only from three to four per cent., in the ordinary commercial solutions of hydrogen peroxide. As a tooth-bleacher and sterilizer of putrescent canals and tubuli—for the former implies and includes the latter—it has an important additional saponifying and solvent action upon the oils, fats and animal tissue which permeate the dentinal structure, and which so often act as a formidable barrier to the ingress of the bleaching agents ordinarily used. This saponifying action will be seen at a glance when it is noted that the Na_2O_2 by the loss of one atom of O becomes Na_2O; this immediately by combination with a molecular of water becomes $NaOH$, or the ordinary caustic soda which is used in the manufacture of soaps.

After having made a standard solution by dissolving the compound in water to the point of saturation, other solutions of different known strengths can be made from it by adding water in definite proportions to measured amounts of the stock solution. In strong solutions sodium peroxide is a powerful caustic and solvent of animal tissue, as well as a saponifier of oils and fats. These qualities are modified and regularly lessened in intensity by progressive dilution with water. I have used in the treatment of pulpless teeth with putrescent canal-contents, solutions varying in strength from full saturation to one containing about five per cent. of the saturated solution. The most striking illustration of the valuable properties of the compound, is the effect produced upon those cases of offensive putrescent canal-contents when the whole structure of the dentine is permeated and colored by a stinking and fermenting mass of decomposing organic matter, with often a blind abscess as an accompaniment to add to their foulness.

I flood the pulp-chambers and canal with strong solution (fifty per cent., or even saturated) of sodium peroxide, of course having the dam in position to prevent contact of the solution with the soft tissues of the mouth. The activity of the compound is at once made manifest by the evolution of gas, which takes place similarly to that which arises when hydrogen peroxide is used under the same conditions; the action is not, however, so violent or rapid as with hydrogen peroxide. It differs also in two other important particulars from hydrogen peroxide when so used,—viz., the bleaching of all carious and colored dentine in contact with the solution proceeds rapidly, and is quite visible in its progression during the few minutes time employed in one application of the treatment.

In addition to this bleaching action of sodium peroxide is its valuable and saponifying and solvent property. The small shreds of pulp-tissue and organic matter in a partially decomposed state are loosened from the canal-walls and tubuli and saponified, the mechanical effect of the evolution of gas by the action of the sodium peroxide greatly aiding in the cleansing process, which when fully carried out results in complete sterilization of the tooth by the action of a compound which combines the properties of a mechanical cleanser, a solvent of the organic *debris* and fats, a perfect sterilizer of the dentine, and an active bleacher. I have adopted the plan of neutralizing the alkali in teeth so treated by inserting in them for a moment on cotton a diluted solution of hydrochloric or sulphuric acid, afterward washing, and drying with hot air, and then immediately filling them, and out of a considerable number so treated there has not been one case of pericemental irritation even to the extent of soreness.—*Extract Cosmos.*

CORRESPONDENCE.

CHICAGO, May 25th, 1893.

DENTAL OFFICE AND LABORATORY, 620 Race St., Philadelphia, Penn.,

GENTLEMEN:—Will you kindly say to the readers of your journal in your next issue, that the house of the Columbia Dental Club of Chicago, No. 300 Michigan Ave., is open wide to the gentlemen of the profession who visit Chicago this summer, and a cordial invitation is extended to them to make it their headquarters while in the city. You might also say, that if it is so desired, by addressing the Manager of our Bureau of Information, R. C. Brophy, in care of the Club, they can secure such rooming accommodations as they wish.

Very truly, FRANK H. GARDNER,
Ch'm. Local Com. on Entertainments.

COMMENCEMENTS.

UNIVERSITY OF BUFFALO.—DENTAL DEPARTMENT.

The First Annual Commencement Exercises of the Dental Department of the University of Buffalo were held in connection with those of Medicine and Pharmacy, in Music Hall in the City of Buffalo, on the evening of May 2nd, 1893.

The examination before the Board of Curators, which comprises the Dental Examining Board of the State, lasted during the day. After these were finished, the Board held a meeting with doors closed to all, and after thoroughly canvassing their merits, unanimously recommended each of the candidates as well qualified to receive his degree, which was conferred upon him by the Chancellor in the evening.

The number of matriculates for the session was forty-six. The graduates were as follows, each having presented senior tickets from some reputable institution before joining the class: William Johnathan Crawford, Ohio; Edward Harry Lamport, New York; T. De-Forest, New York; William Charles Smith, California; Daniel Hubbard Squire, New York.

ANNUAL COMMENCEMENT OF THE DENTAL DEPARTMENT OF THE COLUMBIAN UNIVERSITY.—71ST SESSION.

Graduates in Dentistry: Charles W. Appler, Maryland; W. N. Cogan, Dist. of Columbia; Robt. L. Nall, Kentucky; N. Willis Pomeray, Dist. of Columbia.

DENTAL SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

The Twenty-ninth Annual Meeting of the Illinois State Dental Society was held in conjunction with the Iowa State Dental Society at Rock Island and Davenport, May 9-12, 1893. The following officers were elected for the ensuing year. Garret Newkirk, Chicago, President; J. W. Cormany, Mt. Carroll, Vice-President; Louis Ottofy, Chicago, Secretary; W. A. Stevens, Chicago, Treasurer; F. H. McIntosh, Bloomington, Librarian.

LOUIS OTTOFY, Secretary.

CHICAGO DENTAL SOCIETY.

At the Annual Meeting of the Chicago Dental Society, held Tuesday evening, April 4th, 1893, the following officers were elected for the ensuing year: J. W. Wassay, President; J. H. Woolly, First

Vice-President; Garrett Newkirk, Second Vice-President; D. D. Davis, Recording Secretary; Geo. J. Dennis, Corresponding Secretary; E. D. Swain, Treasurer; J. H. Snyder, Librarian.

Board of Directors:—Edmund Noyes, J. G. Reid, Geo, H. Cushing.

Board of Censors:—E. R. C. Carpenter, D. C. Bacon, H. W. Sale.

Geo. J. Dennis, Corresponding Secretary.

BOOK NOTICES.

A Compend of Dental Pathology and Dental Medicine, containing the most noteworthy points upon the subject of interest to the dental student, and a section on Emergencies. By Geo. W. Warren, D. D. S., Chief of the clinical staff, Pennsylvania College of Dental Surgery, Philadelphia *Second edition, Illustrated.* Philadelphia: P. Blackiston, Son & Co., No. 1012 Walnut street; 1893.

This valuable little work for the use of the dental student has gone through a second edition in comparatively a short time, which is an evidence of its merit. It is now presented illustrated, together with a valuable section on Emergencies. The contents are only such as claim the attention of the student in a marked degree, and there are presented in such a plain, forcible and elegant style as to impress all who read and study it.—Ed.

Orthodontia; or, Malposition of the Human Teeth: Its Prevention and Remedy. By S. H. Guilford, A. M., D. D. S., Ph. D., Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College, Author of "Nitrous Oxide," etc. Approved by the National Association of Dental Faculties as a text book for use in schools of its representation. Second edition, revised and enlarged. Philadelphia: Press of Spangler & Davis, 529 Commerce street.

Dr. Guilford's valuable treatise on the regulation of the human teeth is before us, and its second edition, put forth in so short a time after the issue of the first is the best evidence of the esteem in which the book is held. This edition contains many valuable hints, suggestions, tables, processes, cuts, etc., etc., etc., explanatory of the manner of constructing regulating appliances of which the first edition did not treat, which makes it, independently of its other worthy features a great improvement over the first edition,—Ed.

The Annals of the Philadelphia County Dental Society.—Philadelphia, Pa., 1893.

The above publication gives the history of this dental society.

The object of the society is not so much for the reading and discussion of papers on dental subjects as for the enforcement of the laws appertaining to the practice of Dentistry in Pennsylvania. The officers are F. L. Bassett, President; Alazo Bryce, Vice-President; G. J. R. Miller, Treasurer; and W. A. Phreaner, Secretary. The book is well gotten up and nicely printed, and contains the list of its members, a report of the work it has done, its directors, committees, etc., etc.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION, at the Thirty-second Annual Session, held at Niagara Falls, N. Y., commencing on the 24th of August, 1892, compiled by the Publishing Committee, Geo. H. Cushing, E. T. Daily, A. W. Harlan. Philadelphia: The S. S. W. Dental Mfg. Co., 1893.

The work contains a list of the officers of the organization, as well as of the different places of meeting from the year 1859 to the date of its last meeting in 1892, as also a voluminous table of contents, and other matters appertaining to the doings of the society at its last annual gathering. The papers and discussions on them are interesting and instructive and well deserve preservation.

PRACTICAL PLACE.

OBTUNDING SENSITIVE DENTINE.—BY HENRY BARNES, D.D.S.

After the dam is applied I take Dr. Black's 1 2 3 mixture, which is carbolic acid, 1 part; oil of cinnamon, 2 parts; oil of wintergreen, 3 parts, on a pledget of cotton, placing the cotton in the cavity, and with my chip syringe, having a platinum point, draw the heated air from the lamp, heating the nozzle of the syringe red-hot, blow gently on the cotton until the oil is drawn from it. This is done repeatedly, until the cotton looks as though scorched by fire. Now, removing the cotton from the cavity we are able to cut out quite a considerable amount without pain to the patient. This is especially true of the leathery white or light brown decay found in the teeth of young children.—*Ohio Dental Journal.*

A NEW anæsthetic has been given in the name of Pental. It is produced in Germany, its inventor being Professor Von Mering, Director of the Medical Polyclinic in Halle, who chose the name he has given it owing to the circumstances that it contains five carbon atoms. It is very volatile and easily combustible. It can, it is said be administered like chloroform, and the quantity required each time

need cost no more than 6d. Anæsthesia set in after three or four minutes—rarely later. It is not deep, but sufficient to render small operations, such as the extraction of teeth, painless. It is neither accompanied nor followed by any unpleasant effects.—*Southern Dental Journal.*

After taking a plaster of Paris impression, brush it over with soapstone before pouring. An old worn-out toothbrush is the best. I also coat the model and the opposite with the same before packing. Sometimes I also add a coat of soapsuds.

Every dentist should prepare his own devitalizer. Put a small quantity of creasote in a large-mouthed bottle, then mix in an equal amount of arsenic, stir thoroughly, into which mixture drop your pellets of cotton sufficient to absorb the mixture.—G. V. N. Relyea, L.D.S , Oswego, N.Y.

Dental Dots.

To Dry a Cavity before Filling.—After applying absolute alcohol to the cavity, use a solution of sandarach and ether to line the cavity; dry this with hot air, which forces it into the ends of the tubules, completely sealing them, then proceed with the filling.

To Prevent Plaster Adhering to Rubber Plates.—Coat the model with a thin solution of soap and water just before packing the case.

Rubber bands, tubes, etc., that have lost their elasticity and easily snap, may be restored by steeping for half an hour in dilute water of ammonia (aq. ammonia, 1 part; water, 2 parts).

German engravers harden their tools, says the *English Mechanic,* by heating them to a white heat and then plunging them into sealing-wax, continuing the operation until the tool is cool. By this method the steel becomes almost as hard as diamond, and when touched with a little oil is excellent for engraving or for drilling into other metals.

"As a local anesthetic," says Dr. C. B. Atkinson, "for extracting teeth, congested pulps, and in opening abscesses, phenate of cocain has proved a valuable aid, entirely subduing pain without constitutional impression."

Register (J. E.) on Treatment of Root Canals.

I rarely at the present day have a fistula to treat. Only yesterday a lady came in to see me. She had a central incisor that had been treated for a number of years in the usual method. I operated on the

tooth but once. It had a fistula and a gum-boil at the end of it. I first washed it out with an atomizer, and after that by dilute sulphuric acid. I used this in about an eight-per-cent solution, as a solvent to dissolve the carbonaceous matter that filled the tubulated structure of the dentine. I then followed this with Labarraque's solution. If there is a fistula it is given a treatment with acid of four per-cent. solution. I avoid using air intensely hot —*Extract International.*

Jackman (W.T.) on a Method of Finishing Pink Rubber Around and Between the Teeth.

For this purpose take a little rubber cup and use a thin mixture of corundum flour and water. You know that the most difficult part of making a rubber plate when plain teeth are used, is to finish around and between these teeth. With this little cup, used with the engine as directed, the most difficult part has become the easiest, and it requires but a few minutes' time. You are enabled to get a polish on the rubber of the interdental spaces that it is exceedingly difficult to get in any other way.

Profuse Hemorrhage.

Never give stimulants in a case of profuse hemorrhage. The faint feeling, or irresistible inclination to lie down, is Nature's own method of circumventing the danger, by quieting the circulation and lessening the expulsive force of the heart, thus favoring the formation of clot at the site of injury.—*Clinique.*

Will It Remove Broken Nerve Broaches?

Charles F. Huber, of Hamilton, Ohio, has invented an electro-magnet used for the removal of particles of steel, iron or nickel from the eye. Dr. Frank Borden assisted in the development of the idea, and now he has the first instrument that has been made. It has the enormous power of lifting eighteen hundred grains of metal with but two volts of electrical energy.

To Relieve Pain After Extraction.

When pain continues immediately after the extraction of a tooth great relief is often afforded by placing in the socket a pellet of cotton moistened with equal parts of chloroform and tincture of aconite. Or a mixture of one drachm of camphor with two of chloroform, applied on a pellet of cotton to the socket, will likewise afford relief.

When the pain continues for several days, as it sometimes will, the following, applied to the socket and to the gums will afford relief :

℞ Morphinæ..gr. vj.
Tincturæ aconiti ....
Chloroformi ....
Alcoholis.................................aa f. oz. j. M.

How to Preserve Rubber-Dam.

Put it in a glass jar and fill with water, close the jar up air-tight, and let stand in a cool dark place for two weeks, and then rinse the rubber in clean fresh water. Put the rubber back in the jar and fill with water, and keep as before. I have a sample of rubber that I have kept over five years in this way that is as *good as new* —Dr. R. R. Rykert, Attica, N. Y.—*Items.*

To Dry a Cavity Before Filling.

After applying absolute alcohol to the cavity, use a solution of sandarach and ether to line the cavity ; dry this with hot air, which forces it into the ends of the tubules, completely sealing them ; then proceed with the filling.

The Dentists at a Disadvantage.

Although modern skill and science have not yet been able to abolish death, they can do much to conceal the ravages of time and the advance of age. False teeth, false eyes, false hair and false legs and arms are now fashioned to imitate nature's handiwork so cunningly that old men and women may be made to look almost as good as new, whether they feel so or not. But if all the artists and professional gentlemen who minister after this fashion to the needs of the human form divine shared the views of Dentist Charles A. Van Duzee, of Minneapolis, some of those who are "made up" by the help of these cunning artificers might have occasion to tremble for their borrowed charms. Dr. Van Duzee, it appears, made a set of teeth for a citizen of Minneapolis, and when he failed to pay for them got a judgment against the delinquent and endeavored to seize the teeth on execution. The defendant refused to give up the teeth, which were firmly fixed in his mouth, and the sheriff not desiring to violate the personal rights of a citizen, or to have his fingers bitten in the attempt to secure the property, asked the court for further instructions. The dentist's attorney argued that the court should order

the defendant to surrender the teeth, and if he did not comply, have him arrested for contempt. The defendant contended that a man's person, though but a tenement of clay, was his absolute property for life, and that the teeth being on his premises, the sheriff would be a trespasser if he undertook to insert his fingers into defendant's mouth to remove them. He claimed further that the teeth had become a part of his person, and that the court had no more right to drag them out of his head than it had to tear off one of his limbs. In his opinion the court, Judge Kelly, said:

"It is suggested these teeth are a part of defendant's anatomy. It does not appear how securely they are attached, but the defendant evidently entertains great attachment for them. They have become, so to speak, fixtures. And whether or not they may be removed without serious injury to the freehold does not clearly appear. The court cannot take judicial notice of the manner false teeth are kept in place. Though not attached to the reality in the ordinary sense, yet practically speaking they are, for all flesh is dust. Suitable food is necessary to good health. Nature (and art in this case) provides teeth for mastication. It will not do to say that defendant may subsist comfortably on soups and hash The one, as a steady diet, is thin and unsatisfactory; the other, always mysterious. Conceding the plaintiff hold a judgment against this defendant for an unpaid portion of the purchase price of these teeth, and defendant has no other property subject to execution, and that goods sold and delivered are not, under our law, exempt from execution and sale for the purchase price, these teeth having become a part and parcel of defendant's anatomy, are, while so used and worn, not subject to levy and sale. Plaintiff's contention leads to queer results. If I apply the law as plaintiff insists where will the court draw the line? Legs, arms, eyes, wigs. curls and bangs—the false and artificial of course—may all be brought to light and within the dread power of the sheriff."

If Judge Kelly's decision is sustained in other States, the only way in which the makers of false teeth and other artificial aids to personal comfort and beauty will be able to recover property of this description, which has not been paid for, will be to seize it during the night, while the debtors are asleep and these portions of their anatomy are reposing on chairs or dressing tables. To wake up in the morning and find one's self minus hair, teeth and a limb or so would be a decidedly disagreeable experience. To prevent a catastrophe, which would bring about a transformation in the personal appearance as

startling as that which changed the lovely "She" into a withered hag, it would be better to pay for these properties at the outset. Otherwise even if not snatched from the possessor by stealth, they may become the subjects of legal satire and judicial jest.—*The Baltimore Sun.*

BONWILL (W.G.A.) ON THE PROPER FITTING OF CLASPS SO AS TO PREVENT WEAR AND CARIES.

The metal should be of platinized gold only, without any lining of pure or twenty-two-carat gold soldered on it next to the crown. The metal should be loosely fitted to the crown on the plaster cast and afterwards fitted in the mouth directly upon the tooth and made to touch in at least four places. It should not fit accurately every inequality of the surface.

If a clasp fits minutely all the surface of the crown, it makes of the minute space between the crown and clasp a capillary surface, and keeps the mucous secretions, as well as the fine food, forever in contact and with no space for circulation of the saliva. Whereas, if the band touches but a few places on the tooth crown, it will rest just as firmly if it has been well fitted in the mouth and allowed to take its own position when tried upon the crown.

Capillary power made by surfaces very closely approximated is the surest means of producing caries. Where a space is left, the points that do touch are in absolute contact, and, aside from a slight wear on the tooth, the surface cannot decay as when there is an actual and close fitting. If made of pure soft gold, there would always be danger.

BROWNE (W. G.) ON A METHOD OF MAKING GUTTA-PERCHA FILLING.

Prepare the cavity, apply rubber dam or napkins, dry out cavity with an absorbent, put in the gutta percha and apply heat from a hot air syringe, which will both soften the material for working it and dry the cavity at the same time.—*Catching's Compendium.*

Dr. C. N. PIERCE says blotting-pad which has been saturated with a 40 per cent. solution of nitrate of silver is better than the pure crystals for sensitive dentine. "This preparation," he says in the *International*, "seems to work very happily, and is of abundant strength *for all* purposes required in the mouth, whether for cauterizing the soft tissues or acting on the hard. It is well known that

nitrate of silver is very soluble, dissolving in its own weight of water. This strong solution I tried first on some short fibre of cotton, but found, when dried, that the cotton was entirely destroyed. This strength—40 per cent.—is about as strong as it can be used without some destruction of the fabric. The pad, thus prepared, can be cut into small pieces, and be always ready for use, if it be kept dry."

CARBOLATE of camphor is made, says the *Therapeutic Gazette*, by adding one part, by weight, or carbolic acid to three parts of camphor, setting aside for twenty-four hours, and straining through gauze. It is a permanent liquid, with a specific gravity of 990. It is thoroughly antiseptic, and possesses unsurpassed germicidal powers. Locally applied to wounds, by means of cotton or gauze, it prevents suppuration. When kept in contact with the skin for several days it produces an eruption, which can, however, be prevented by mixing the liquid with oil. Injected hypodermically it gives the best results in aborting abscesses or boils and relieving pain.

AN AGREEABLE BICHLORIDE SOLUTION.

I have mercuric bichloride on my shelf in a bottle, containing a one per cent. solution. When wanted, I prepared from this a solution of the proper strength, one to one thousand; but instead of water I take rose-water.

IMMEDIATE REMOVAL OF DENTAL PULP.

A completion of these cases at the first sitting is greatly to be desired, for when properly done, we know there will be no future trouble with that canal. The only thing that has stood in the way has been the exceeding painfulness of the operation. I have been successful in nearly all cases, by first applying the rubber-dam and cleansing the cavity as well as can be done without pain, when I saturate a pellet of cotton in a 15 to 20 per cent. solution of muriate of cocain and apply to the cavity. After a little time the excavation may be continued, and in this manner, proceeding gently, the pulp may be exposed. The exposure should be so small that the point of a hypodermic syringe will barely pass. Then using the solution, freshly prepared, a few drops are quickly and forcibly injected into the pulp. The exposure can then be enlarged, and with a Donaldson *barbed* broach the nerve can be removed entire. Thoroughly cleanse and dry the canals and fill with chlora-percha and gutta-percha points

and complete the filling at once. See that the sharpened point of the syringe is not too long; if it is, cut it down with corundum in the engine to a very short but sharp slope, that the point need not enter very far to get the fluid into the tissue. If you have not tried this method, do so, and you will be surprised at the success you will have. Very flat canals are the most difficult but will not cause more pain than when arsenic is used, besides the great saving of time.—ROBERT L. BLAKEY, Brunswick, Mo.

Take base plate gutta-percha, dissolve in chloroform, allow the chloroform to evaporate, and you have a gutta-percha for temporary stoppings superior to the usual base plate.—*Dental Tribune.*

CURATIVE USE OF CHARCOAL.

The Boston *Journal of Commerce* discources thus on the uses of charcoal: Besides being valuable as fuel, it has other uses which make it one of the most serviceable of articles. When laid flat, while cold, on a burn, it causes the pain to abate; by leaving it on for an hour, the burn seems almost healed when the wound is superficial. Tainted meat surrounded with it is sweetened. Strewn over heaps of decomposed pelts or over dead animals, charcoal prevents unpleasant odors. Foul water is purified by it. It is a great disinfectant, and sweetens offensive air if placed in shallow trays around apartments. It is so very porous that it absorbs and condenses gases rapidly. One cubic inch of fresh charcoal will absorb nearly one hundred inches of gaseous ammonia. Charcoal forms an excellent poultice for malignant wounds and sores. In cases of what is called proud flesh it is invaluable. It gives no disagreeable odor, corrodes no metal, hurts no texture, injures no color, is a simple and safe sweetener and disinfectant. A teaspoonful of charcoal in half a glass of water often relieves sick headache. It absorbs the gases and relieves the distended stomach, pressing against the nerves which extend from the stomach to the head.

A CRACK in a piece of metal is prevented from extending further by the well known means of drilling a hole where the rent ends; but when the whole is not bored on just that spot, the crack is apt to continue beyond the hole. To facilitate the search for the exact point, *Revue Industrielle* recommends moistening the cracked surface with petroleum, then wiping it, and immediately rubbing it with chalk. The oil that has penetrated into the crack exudes and thus indicates with precision where the crack stops.

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[EIGHTEENTH PAPER.]

OPERATIVE DENTISTRY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

(Dental Materia Medica, Continued.)

CARBOLIC ACID.

Carbolic acid is rather an alcohol than an acid. It is also known as phenic acid or phenol. It is derived from coal tar by a chemical process. When pure it exists in the form of white crystals, which interlace into each other. In cold weather this condition continues, but by heat the crystals deliquesse or melt, and at a temperature of 95° F. it becomes fluid. It is used in the fluid form in dentistry. It dissolves readily in alcohol, ether or chloroform. It may also be rendered fluid by the addition of cologne water. It is useful as a styptic to arrest the hemorrhage after tooth extraction, but to make it combine with water it is first necessary to mix it with glycerine, after which the water may be added.

After the cavity in a decayed tooth is prepared, preparatory to filling, it is recommended to bathe the entire floor and walls of such a cavity with carbolic acid.

It is one of the most extensively used and most useful drugs in the dental polychrest. It is a good obtundent of sensitive dentine. When toothache proceeds from a nerve or pulp nearly uncovered or quite exposed, it will allay the pain, in such cases, almost instantly. For capping an exposed pulp it forms an eschar or scab which aids the subsequent capping and filling of the tooth. It is used for the treatment of putrescent pulp and alveolar abscess by combining it with glycerine. It is not so extensively used now, in the treatment of alveolar abscess or putrescent pulp, as formerly, because other agents possess greater antiseptic and germicidal power. It strongly resembles creosote and has the odor of tar. It is a great irritant and escharotic. Should it fall on the lip while using, it forms, almost

immediately, a white eschar. The irritation caused by such an accident is felt immediately by the patient in an itching sensation, but the effect may be as instantly removed by the application of glycerine to the spot. It is recommended as a gargle in diphtheria, and as an ingredient of mouth washes, leaving a pungent, clean, detergent condition of the mouth. It is a germicide, disinfectant, antiseptic and anæsthetic agent.

The dose of carbolic acid varies from $\frac{1}{4}$ to 1 grain, largely diluted, or one drop added to glycerine and then diluted.

In large doses it is a poison. It causes pains in the stomach, a whitened and shriveled appearance of the lips, mouth and throat, contracted pupils, vomiting, snoring, coma and death in from five to ten minutes or eight to ten hours, according to the quantity taken.

The antidotes are olive oil, castor oil, lime water, white of egg, mucilage, carbonate of lime.

Applied to soft spongy gums when diluted with alcohol it renders these firmer and healthier. It corrects a bad breath, and assists in the promotion of a better suction in upper dentures when the gums are bathed with it.

Cajeput, or Oil of Cajeput.—This substance is obtained from the leaves of a tree which grows profusely in the Malay peninsula. The tree is small and the branches droop in the style of the weeping willow tree. The oil is derived from the leaves by distillation. It is a transparent oil of a pale greenish color, warm and pungent to the taste, very volatile and inflammable, and has an odor similar to camphor. When taken into the stomach it produces a sensation of warmth, and causes profuse perspiration. It is much esteemed as a remedy for rheumatism, headache, nausea, hysteria, etc. The dose is from 1 to 5 drops on a lump of sugar. Its use in dentistry is limited, being used to relieve toothache, being applied to the carious tooth on cotton floss.

Chloride of Zinc.—This substance is made by the action of acids on zinc. The zinc, in small pieces, is put into an evaporating dish, and hydrochloric acid previously mixed with water is added little by little, until there is no longer any hydrogen gas given off. It is then boiled and the water that is lost by evaporation is supplied, after which it is permitted to cool, when it is strained, after which carbonate of zinc is added, when it is again filtered. It then becomes a white solid. It is then crushed or powdered and kept in glass stoppered bottles.

It is a valuable agent in dentistry and is perhaps one of the bes

local applications for sensitive dentine that we have. It has a great affinity for water and seems to act by dehydrating the dentine. It is applied preferably in the crystals to the cavity, the moisture being excluded by the use of the rubber dam, when the part which was unbearably sensitive before may be cut and scraped without inflicting pain The application at first causes considerable pain, but this gradually subsides. The pain caused by its application being preferred by patients to the pain inflicted by the excavating instruments. It should remain in the cavity from two to four or five minutes. It should not be used in cases where the nerve is nearly exposed, for then it is apt to act as a devitalizer. If the gums be accidentally cut during the process of excavating a cavity, the hemorrhage may be arrested by the application of delequessed chloride of zinc. It is useful as an agent for the treatment of alveolar abscess, putrescent pulp, and in any case where a good disinfectant or deodorizer is needed. It is used in cases of pyorrhea alveolaris with success, and when largely diluted with water is useful for any of the gangrenous conditions of the mouth and mucous membrane thereof, being applied in such cases with a camel's hair pencil. A solution of it is used with the oxide of zinc as a temporary filling material. But as this material causes considerable pain in its application it is not often employed now as formerly—but extensively by some as a root filling.

Chloroform.—This substance is obtained by distillation of alcohol with chloride of lime, and is purified by agitating it with sulphuric acid. Its principal use is as a general anæsthetic, but it is likewise used, combined with other substances, as a local anæsthetic. It is administered internally as an anodyne and antispasmodic for nausea, sea-sickness, headache, colic, whooping cough, intermittant fever, etc. It has a sweetish taste, and produces a burning sensation to the mouth and throat with a sense of warmth. *In large doses it is a poison.* Its principal use in dentistry as a medicine is as a general anæsthetic. Combined with tinct. iodine or tinct. aconite it is used as a counter irritant in cases of incipient alveolar abscess or in pulpitis ; and largely diluted with water it has been successfully used to arrest hemorrhage after tooth extraction. From 1 to 5 drops in sweetened water is the internal dose, and from 1 to 2 drachms for administration as a general anæsthetic. Its acts benignly as an obtundent, and placed in the cavity of a decayed tooth which has been isolated from moisture by the use of the rubber dam, it saves the patient considerable of the pain of excavation.

Cloves—Oil of Cloves.—This substance is obtained from the buds of an evergreen tree which grows profusely in India. The buds are placed in water to which common salt is added, and this is brought to the boiling point, when this water is distilled, and from the distillation the oil is procured. It has an aromatic property, but is of a hot bitter taste. It is used to relieve nausea and vomiting, and to excite digestion, and to correct flatulence. The internal dose is from 2 to 5 drops. In dentistry it is used as an obtundent, for the relief of toothache, when carbolic acid or creosote cannot be applied. It is frequently mixed with creosote and with carbolic acid, and the mixture seems to act more favorably, often, than either of these drugs singly, and is generally more acceptable to patients. It is used singly or combined with these drugs in the treatment of alveolar abscess and putrid pulps. It enters largely in the composition of tooth washes. It is the active principle of *eugenol.*

Canabis Indica. (Indian Hemp.)—An extract is made of this from the flowers of a plant which grows in India. The female plants are selected. The extract is made with alcohol. It is cultivated in many parts of Europe and Asia, as also in some of the Western States of this country, but the Indian variety is exclusively used for medicinal purposes. It is used by the natives as an intoxicating agent. The flowers are used when dried, from which a resinous principle is derived. It is called hashish by the Arabs. The resin is often mixed by the natives with tobacco and smoked for the exhilarating influence produced by the mixture. It has a peculiar narcotic property producing vertigo, headache and a species of delightful intoxication in which the most delightful sensations are experienced. It is of a blackish color, of a fragrant and narcotic odor, and a slightly warm and bitter taste. It is aphrodisiac in its effect and increases the appetite. *In large doses it is poisonous.* It is employed to produce sleep in morbid conditions of the system, to allay spasms, compose inquietude and relieve pain. It resembles opium in its action. It checks the secretions and constipates the bowels. It is less certain, but is sometimes preferably employed to opium. It is used for neuralgia, gout, rheumatism, tetanus, hydrophobia, cholera, convulsions, hysteria, delerium tremens, etc. The dose is from one half to one grain, but in some instances as much as twelve grains have been given, but in such cases the dose is gradually increased. Its use in dentistry has been for its topical obtunding effect on the dentine as well as its numbing effect on the gums. By slightly warming a drop or two of a strong tincture or extract and placing this in the cavity

of a tooth under preparation for filling, and permitting it to remain in place for 4 or 5 minutes, a very decided obtunding effect is noticed in the dentine.

Chromic Acid.—This medicine is derived by the action of strong sulphuric acid upon a solution of bichromate of potash. It is of a dark red color in long crystals like little sticks. It absorbs moisture readily, and when alcohol and water are added to it makes an average yellow solution. It is a powerful caustic and has the greatest affinity for animal tissue. It is employed in the removal of cancerous growths, piles, warts, syphilitic sores, etc. In dentistry it is used to obtund sensitive dentine, the removal of tumors, morbid growths of the gums and fungus growth of the dental pulp. When used in the mouth the parts should be carefully protected by a napkin or by the rubber dam. A weak solution may be used to arrest recession of the gums. It is sometimes combined with glycerine, in which case the glycerine is added drop by drop—to avoid an explosion. It should be applied to the part with a gold wire, or a glass rod. One ounce of water is added to 10 grains of the acid, and this solution used to paint the gums with a camel's hair pencil, three or four times a day It is never given internally.

Cocaine.—This medicine is obtained from the leaves of a shrub which grows profusely in Peru and Chili, of South America; 480 grains of the leaves will yield 1 grain of the alkaloid. The hydrochlorate is in the form of white crystals. It is inflammable and burns with a brilliant flame. It is without odor. It is a local anæsthetic. It paralyses the nerves and is particularly useful in operations on the eye. In dentistry it is sometimes used hypodermically as a local anæsthetic for the extraction of teeth. But such varying success and failure have been reported, and such serious and sometimes fatal results have followed its use in this way that it is not generally employed. Many report remarkable success with it in the painless extraction of the dental nerve by applying it in solution to that organ when fully exposed. For this purpose, Prof. Harlan recommends a solution made of 10 grains of hydrochlorate of cocaine in 90 drops of sulphuric ether, and states that applied to an exposed pulp for 5 minutes, its painless extirpation can be accomplished. As an application to the gums about teeth that are to be ligated in order to hold the rubber dam in place good results have been obtained with it. To overcome the nausea, incident to the taking of impressions of the mouth, particularly impressions in plaster of Paris, the painting of the gums with a 4 per cent. solution of cocaine with a camel's hair

pencil has been highly recommended. Combined with arsenic it is used as a painless devitalizing agent for the dental pulp.

Cosmoline.—This drug is known also by the names of vaseline, petrolatum and petroleum ointment. It is derived from coal oil. It is insoluble in water but soluble in ether or chloroform. It is used as a dressing for cuts, burns, sprains, piles and inflamed surfaces, and as menstrum for other medicine. Dental uses: Combined with iodoform or carbolic acid it is used as a dressing for root canals. It is also used for chapped hands and lips and on all bruised, sore, and excavated surfaces of the gums and mucous surfaces of the mouth.

Capsicum, or Cayenne Pepper.—Is derived from the tropics. The fruit in small bright red berries are dried and ground to a powder. It is bitter, acid, and burning to the taste and has an aromatic odor. It is a powerful stimulant, producing a general warmth and stimulates digestion and circulation, and excites the genital organs. *In large doses it is an irritant poison.* It is used as an ingredient for gargles in sore throat and for dyspepsia, colic, searlet fever, etc. The dose in powder is from 5 to 10 grains in pill form. In the tincture form 10 drops to 1 fluid drachm. In dentistry it is useful as a counter-irritant to the gums in the early stages of periodontitis, or when it is necessary to hasten suppuration. It is useful in the turgid or puffy condition of the gums, and for looseness of the teeth as the result of mercurial salivation. Combined with powdered ginger and made into little pads it is used on the gums over the roots of teeth affected by pericimental inflammation.

Carbonate of Soda.—Used in dentistry to relieve the pain so frequently found at the gum margins of the teeth when using the toothbrush. It is also useful as a detergent for the cleansing of root canals affected with putrescent pulps.

Creosote.—Is derived from the distillation of wood tar. When fresh it is a clear oily fluid, with an odor resembling carbolic acid, but exposure to the light turns it a dark reddish or brown color. Its purity may be tested by dropping it on paper. If pure it will leave no stain when volatilized by heat. It is stimulant, antiseptic, escharotic and styplic in its action. *In large doses it is a poison.* Applied to the tongue it gives great pain, and produces a profuse flow of saliva. It is useful in nausea and sea sickness. The dose is from 1 to 2 drops in a lump of sugar or combined with mucilage. In dentistry it is used in all cases where carbolic acid is indicated and in the same way. Combined with the oil of cloves it is used as an obtundent and disinfectant. It is preferred by many to carbolic acid.

It is not so painful an escharotic as carbolic although sufficiently so, but the reaction from it is more soothing. The escharotic action may be mitigated with glycerine. It may be used in full strength or diluted, and its dilution is effected with glycerine the same as carbolic acid. Applied to the walls of a cavity of a tooth prepared for filling, it seems to harden the dentine and leaves it in a better condition than when not used, apparently soaking into the dentinal tubuli. The excess should be wiped out of the cavity before inserting the filling.

[TO BE CONTINUED]

THE COMBINATION OF GOLD AND VULCANITE WORK.

By Thodore F. Chupein, D. D. S., Philadelphia, Pa.

There are many cases where a small vulcanite plate may be made with gold clasps which is worn with much greater satisfaction by the patient, than when reliance is placed on a plate held in place by atmospheric pressure and covering the whole roof of the mouth.

Apart from the discomfort of having a large plate covering the palate, the distiguring of the mouth by the constant drawing of the suction chamber, and the liability to drop or move or tip, unless the patient is always on the alert to keep it in place by constant sucking, there are other reasons why such large plates are objectionable to the wearer; and in our practice, we have found, that all for whom we have made these small plates, wear them with much greater satisfaction.

Fig. 1 represents a case where the two lateral incisors are lost. The lady had been wearing a vulcanite plate held in place by atmospheric pressure, and was much annoyed by the plate's constantly moving, though it did not actually drop from its place.

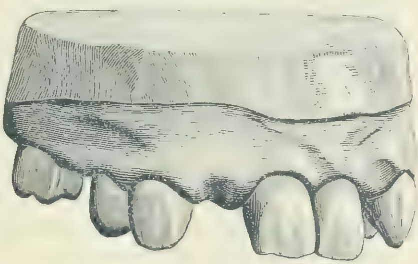

Fig. 1.

Our plan of procedure in such cases *had been* to take a plaster impression of the gums and teeth and after making the model to bend clasps to the teeth we deemed best, and then to solder extensions to

the clasps, as shown by Fig. 2. When this is done, the clasps are placed on the teeth of the plaster models, a wax plate is made, the teeth ground and fitted and then united to the plate, when the case is flasked, packed, vulcanized and finished.

But although the utmost care may be used in the carrying out of

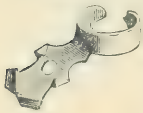

Fig. 2.

apparently simple cases of this kind, it will often be found that when the case is ready to be inserted it does not fit as snugly in the mouth as the particular and conscientious workman desires, so that we have lately pursued a plan, which, although entailing a little more trouble, *invariably* results more to the patient's and operator's satisfaction.

When the clasps are made, as shown in Fig. 2, the under side of the extension, or that part which lies next to the gum, is covered with a thin bit of wax. The object of this is to keep the extensions a little distance from the gum so that when vulcanized the vulcanite will flow below the extensions. The clasps and extensions are now placed on the teeth in the patients mouth, as shown by Fig. 3, and a plaster of Paris impression is taken, with the clasps and extensions in their places. The clasps generally come away in the impression. If they do not they can be accurately put in place. A model is then made,

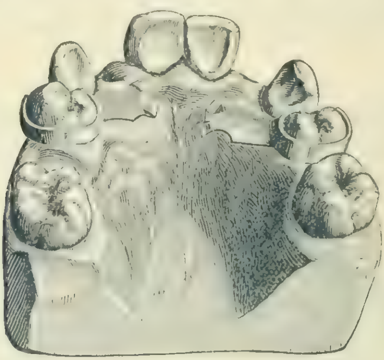

Fig 3.

a wax plate made on the model, the teeth ground and fitted, and the case flasked, packed, vulcanized and finished. And done in this way it goes into place when inserted, and fits like a glove, and is a joy and satisfaction to both patient and operator.

Should the bite be so close as to prevent the employment of vulcanite teeth, a plate tooth may be employed with an extension, as

shown by Fig. 4, which is adjusted to place and the case carried through as already described.

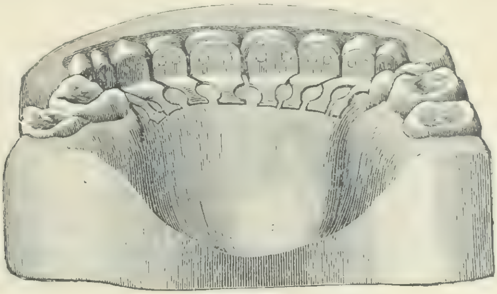

Fig. 4.

If the operator should not have the time to take an impression and make a model and then fit clasps and extensions to the plaster teeth of the model, the clasps may be fitted to the teeth *in the mouth* and the impression taken with the clasps on the teeth in the mouth, after which the extensions may be soldered to the clasps that are on the model.

Indeed, whether for this style of work or for gold or silver plate work, where clasps are used we think it is a much better plan to fit the clasps to the teeth in the mouth and then take the impression, than to rely on the fitting of the clasps to the model, however accurate the model may be.

NAMBY-PAMBY DENTISTRY.

By Theodore F. Chupein, D. D. S., Philadelphia.

In the intercourse which we have with our patients, we sometimes meet some queer customers, or rather some who are disposed to want inconsistant things.

It is to be presumed that when a patient seeks a physican, a lawyer, an aurist, a dentist or a specialist of any kind that he comes for such service as either of these are able to confer. But it seems to be the height of the rediculous if such patients would dictate the course of treatment these practitioners should pursue. Yet, as far as dentistry is concerned, we know that such is the case, and we know too, unfortunately, that there are many dentists, actuated by whatever motive, we cannot say, yield to the whims, freaks, or foibles of their dictating patients.

We would not have it understood that we are opposed to sympathy or that we would fail to use all the means which lay in our power to

assuage suffering, or to lessen the disagreements incident to dental operations, yet we hold, that when pain is to be inflicted and there are no means of avoiding this, the patient is to bear it, and the dentist in the pursuit of his calling must inflict it, how much physically his patient has to submit, and how much mentally the operator has to bear in its performance, and we believe it his duty to his patient to employ all and every means to accomplish his work in the most thorough manner, irrespective of the pain and irrespective of the disagreements incident to the work in hand. Yet it is the experience of all dentists to have patients say, "I will submit to all else, but *I won't have the rubber dam.*" "I can stand the scraping and cleaning, but *I won't have the engine used.*" "If you take the impression with wax all right, but *I won't have plaster.*" Thus are "namby-pamby" dentists trammelled; thus are they handicapped because of the freaks and whims of their patients. If the rubber dam be disagreeable to his patient and the cavity is one easily approached and easily filled; one that can be done as well without the dam as with it, I say by all means yield to your patient's wish; but if the reverse and you know that you cannot do your work as well, stand firm, let your patient go rather than yield. For by so doing you may submit to a temporary loss, but a rich reward will meet your rectitude in the future.

The other objections are the same. When it is necessary to use the engine *use it;* when it is necessary to take plaster impressions *take them*, and do not yield your position. It is so ridiculous for persons to seek you and ask a service at your hands and then to dictate how that service is to be performed.

What would the surgeon say to his cancerous patient, who would tell him he must remove the cancer *without the knife?* What would the physician say to his invalid who would object to his *nauseating medicines*, and ask a cure on his own line of treatment?

Unfortunately we see too much of this surveilliance to patients. One will say, "I must yield to this one, as it is one with extensive connections, and wealthy surroundings." "I must yield to that, as it is one of a large family who pay well." "I must yield to the other, as it is one whose influence is extensive and will do me good by its recommendations." Thus this servility to the "Golden Calf" warps justice, warps rectitude, and makes us feel in our own conscience that we have bent the knee to Mammon.

[SIXTEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore Chupein, D. D. S., Philadedphia, Pa.

Q. In our last question we asked you the philosophy of the pain which was induced by cutting the dentine. Can you tell me when is the cutting necessary?

A. In the preparation of deep seated caries, where a hole or cavity has been made in a tooth, from the effect of decay.

Q. If the hole or cavity is made in a tooth by decay, why is it necessary to inflict pain; it would appear unnecessary since decayed tissue is dead tissue, and anything dead should not give pain, the removal of such decay should be painless?

A. It is not necessary in the treatment of deep seated caries merely to remove the decayed or dead tissue that we find in such cavities, because such removal does not leave the cavity the proper shape to retain the filling material; secondly, although the removed or dead tissue is sometimes painless, yet, at times, and in some cases it assumes an abnormal character, and the removal of it gives exquisite pain; thirdly, it is the operation of making the cavity the proper form, whereby the sound dentine is cut, that the exquisite pain felt by the patient is induced.

Q. You speak of sensitive dentine, but you say nothing of sensitive enamel. Why is this?

A. Because there is no sensibility in the enamel. The enamel bears the same relation to the teeth that the nail bears to the fingers or toes. The same way they can be cut painlessly, so can the enamel.

Q. How is the operation of filling the teeth regarded?

A. As one of the most difficult the dentist is called upon to perform.

Q. Is this generally so?

A. No; because, as the saying goes, "circumstances alter cases." There are cavities easily approached and easy of access which make the operation less difficult in the one than the other.

Q. Have such cavities any particular location?

A. Yes. For instance: Cavities occuring on the masticating and buccal surfaces of the upper or lower molars; cavities on the masticating surfaces of the upper or lower bicuspids; cavities on the palatal surfaces of the upper cuspids, lateral and central incisors; and cavities on the labial surfaces of the upper front teeth, when these latter are not located at or above the gum margin, are less difficult to fill than when located between the teeth. To answer

briefly, cavities easy of access, which can be clearly seen and directly approached are less difficult to fill than when the approach is hampered or inaccessible.

Q. What then should be the aim of the operator in preparing a cavity to be filled?

A. To make the approach clear, direct and as accessible as possible.

Q. Is this all that is necessary?

A. Besides this he should not sacrifice too much tooth tissue; he should make his retaining groves in strong dentine, avoiding too close an approach to the pulp. He should cut *freely* the *enamel*, removing all weak parts, but cut *sparingly* the *dentine*. All disintegrated and chalky parts of the enamel should be removed and the borders of the cavity made smooth.

Q. Do not these things seem difficult of accomplishment under all circumstances?

A. They are; it is for this reason that we answered that "circumstances alter cases."

Q. What are these circumstances?

A. All approximal cavities.

Q. Are all approximal cavities equally difficult to fill?

A. They are not. The small or medium size cavities occuring in the proximate surfaces of the incisors are less difficult than when such cavities occur in the molars and bicuspids, especially when these are located in their distal aspects.

Q. Why is this?

A. Because, in the first place, the front teeth are more easily approached, the lips are not such a hindrance; secondly, free large spaces can be readily gained in these teeth which is not so easy of accomplishment in the back teeth; thirdly, one has to work on the back teeth by *reflected light* and not by *direct light*, as in the front teeth; fourthly, the muscles of the cheek, in many persons, are very rigid and the operator cannot draw these back, or out of the way, so as to obtain a direct view of what he is doing. These circumstances render proximate fillings of various difficulty according to their location.

Q. Is there any way of overcoming this difficulty?

A. Yes, in a measure, by approaching distal cavities in the back teeth, and cutting through the masticating surface; and in this way, although making a compound cavity, rendering the view and approach more accessible.

Q. Why should not cavities in the mesial faces of the back teeth be treated in the same way.

A. They may be when the decay is so extensive as to leave only a shell of enamel on the msticating surface, but when there exists only a medium size cavity on the mesial face of a posterior tooth, with a compound cavity on the disto-masticating surface of a tooth anterior to it, such a cavity may be readily approached *through* the opening made by the compound cavity, which entails a lesser loss of tissue to the posterior tooth.

Q. What is the rationale of filling teeth?

A. It is found to be the only way of treating deep-seated caries for the arrest of this disease.

Q. Does it always do this.?

A. Unfortunately not always; but executed in a thorough manner it has proved effective in a very large number of instances, and when the filling material is well introduced and suitably selected for the case in hand, and afterwards kept clean by the patient, it proves oftener effective than the reverse.

Q. What is necessary for the thorough accomplishment of this object?

A. First of all good manual dexterity, coupled with intelligent judgment, so that it may be said that an electrical circuit is set up between the *mind* and the *manipulation* of the operator. In addition to this there should be properly shaped and tempered instruments, and these in such variety as to meet all cases that occur. The filling material should be properly prepared and judiciously selected for the case in hand; the cavity should be so shaped as to receive and retain the filling material perfectly; not only this but it should perfectly fill it as well as exclude the ingress of not merely solids of the most minute size, but fluids as well; the surface of the filling should be made smooth, particularly where this comes in contact with the tooth tissue, so that no deliterious material may lie in contact at these parts; the tooth should be free from pain both before and after the filling is introduced, or if painful before, it should be made painless by obtundents or soothing medicines before the filling is begun.

Q. Is this always possible?

A. If the decay has not penetrated so deep as to leave but a thin septum of dentine covering the nerve it is possible to render it painless before the filling is introduced.

Q. Is it advisable to introduce a filling into a cavity in this condition?

A. A metalic filling would not be indicated under such circumstances, or if a metalic filling be introduced it should have an inter-

posing layer of some material which would prevent the thermal shock induced by metalic fillings.

Q. Suppose the septum of dentine over the pulp is so thin that it would amount almost to an exposure, would you fill the tooth as you have indicated?

A. Opinions are divided on this question; some favoring what is termed capping the nerve; some, and I think of these the greater number, proceed to dentalize the pulp.

Q. How is pulp capping performed?

A. There have been various plans suggested for this purpose, but the one which seems to have the greatest number of adherents perform it in this way. The cavity is bathed with creosote or carbolic acid. The pulp being cauterized by these escharotics; oxide of zinc is mixed to a thin paste with either of the above medicines, and before being introduced over the point of exposure the cautery used is absorbed from the cavity with small pieces of Japanese bibulous paper. The paste is then placed over the floor of the cavity on a minute disc of paper, covering the point of exposure, should there be one. Oxyphosphate of zinc is then mixed *thin*, and a small drop of this is gently carried to the cavity and flowed over the disc of paper previously introduced. When this hardens, some more of the same material is mixed stiffer, with which the cavity is filled, and after a time should the tooth remain comfortable a portion of this may be cut away and the cavity filled with gold or amalgam.

Q. Is the freedom from pain in a tooth thus filled always an indication that the pulp has lived under the capping?

A. It is not. Cases are on record where the capping operation has proved successful and the pulp has lived under the capping; but by far, in the greater number, the pulp has died, although giving no pain under the capping.

Q. If the pulp died under a filling thus introduced would not pain ensue?

A. Pain often ensues from a dead pulp thus encased in a tooth, yet there are many cases known where pulps have thus died and no pain followed its death. This condition might continue for a long time, but a cold taken, the sleeping in a draught, the getting of the feet wet, or any systemic disturbance, would likely result in an alveolar abscess from a tooth so conditioned.

Q. Under these circumstances would you favor pulp capping?

A. The question is difficult of decision. It must be admitted that as a man is a better man with his legs, arms and organs intact, instead

of being cut off, so a tooth must be a better tooth with a live nerve rather than a dead one, so that it behooves us to use every effort to keep this organ alive rather than to devitalize it; yet men are known to live with one arm, or one leg, or even with one lung, and still perform, after a fashion, many occupations. In like manner a tooth may prove a valuable member in the dental arch even though deprived of its pulp.

Q. Are there no indications, from the statistics kept, where this operation has been performed, in which it is likely to fail or likely to succeed?

A. Yes; the cases of successful pulp capping seems to be confined to men and women having hard, dense, flinty, yellowish teeth. Those of the nervous, sanguine temperament; those having sturdy, healthy constitutions, and vigorous bodies.

Q. It would seem therefore that pulp capping is contra-indicated in persons of weaker bodies or different temperaments?

A. Yes.

Q. Are many materials used for filling the teeth?

A. A dozen materials, more or less have been used for filling decayed teeth; but at present the number may be set down to six.

Q. Which are these?

A. Gold, tin, amalgam, gutta-percha, oxychloride and oxyphosphate of zinc.

Q. Is any one of these an ideal filling material?

A. The ideal filling has not yet been discovered.

Q. What attributes should a filling have to be termed an ideal filling?

A. It should be capable of resisting the trituration of mastication, also that of the action of the fluids of the mouth; it should be capable of easy introduction, it should harmonize in color with the tooth into which it is introduced, it should neither shrink or expand in the cavity in which it is put, and it should not be a good conductor of heat or cold.

Q. Do any of the filling materials now in every day use possess *all* of these?

A. No; some may possess one or two, but no one of them possesses all; therefore, no single one of them calls for indiscriminate use.

Q. Which is the most widely used of filling materials?

A. Gold foil is probably the most extensively used of any one filling material, but as its employment requires skill and time, and the

material itself is expensive, amalgam and gutta percha are often employed to fill the teeth of those who cannot afford gold.

[TO BE CONTINUED.]

ATKINSON (C.B.) ON THE USE OF PYROZONE IN DENTISTRY.

The medicinal pyrozone is an aquecus solution containing three per cent. $H_2 O_2$, which represents fifteen volumes of contained gas.

The range of use for this three per cent. pyrozone is similar to that in which the ordinary peroxide has been employed.

Medicinal pyrozone is a good bleacher, but less penetrating in its effects than the stronger preparations.

The antiseptic pyrozone, containing five per cent. $H_2 O_2$, or twenty-five volumes in ethereal solution, seems to be more generally serviceable in dentistry. They are inflammable and volatile. The first use made of them by the writer was in the bleaching of teeth. A pledget of cotton soaked with pyrozone five per cent. was placed in a cavity, and the surface of the tooth wiped with the same strength. It produced a very considerable bleaching effect in a pulpless right superior first bicuspid. This five per cent. strength has been used to remove the brown or green stain about the necks of children's teeth, care being exercised that the fluid does not touch the gum.

As a bleacher, pyrozone is (by its makers) advised to be used after applying an alkali.

Its application on soft tissue produces a bleaching effect strongly resembling an eschar. This progresses slowly after application, therefore caution should be exercised to give full time for this characteristic appearance before further application.

Pyrozone in all strengths is a prompt hæmostatic, although because of the caustic effect sometimes produced by both the stronger ethereal solutions, the three per cent. will probably best serve this office. Pyrozone acts more promptly on moist surfaces than on such as are dry. In a case of pyorrhœa alveolaris, suppurating for eight months previous to presenting for treatment, involving the superior six front teeth from cuspid to cuspid, bicuspids absent, molars *in situ* but unaffected, and the inferior teeth from the right second bicuspid to the left first bicuspid, root of the left inferior second bicuspid *in situ*, crown fractured, the suppuration was controlled after one application of caustic pyrozone (twenty-five per cent.) on all of the teeth except about the transverse processes between the right superior central and lateral, and the left inferior central and lateral. The processes themselves had softened, and will require further time to become restored

to health. In this instance the caustic pyrozone caused a surface coagulation under which, or through which rather, the gas seemed to be liberated continuously, producing a crepitus sensation on passing the finger over the surface. This crepitation gradually subsided, the confined gas seemingly being given off through the external coagulated surface.

The color (white) fades more rapidly from the normal surface than from the abnormal, and as a diagnostic help pyrozone five per cent. seems to have possibilities. Liquid alboline, benzoinol, or other *mineral-oil* product, as vaseline, will be found palliative to the prickling of the caustic.

The continued use of pyrozone has intensified the statements made, and with reference to the five per cent. or antiseptic pyrozone it has been found especially efficient in two somewhat grave cases, one of necrosis where the external plate of the alveolus of the inferior maxilla had been (in extraction) ruthlessly separated from the symphysis to the angle, the teeth of the entire lower denture having been ordered removed by a physician, who had externally poulticed an abscessed right inferior first bicuspid.—*Cosmos.*

A MATRIX IN FILLING.

By W. R. Sine, D.D.S.

The use of the matrix in filling proximate cavities of front teeth where both lingual and labial walls are variably broken down by decay, or abrasion, not only facilitates the process of filling, but becomes a positive luxury, converting a complicated cavity into a simple and easy one of four walls, thus allowing a direct line of approach to the lingual walls from a labial aspect, and rendering it possible to insert a filling of this kind in from a half to a third of the time it would ordinarily require.

For years, in fillings of this character, I have employed thin copper strips for matrices in fillings, preferring this metal because it is readily procurable at any electrical supply shop, also on account of its high melting point, and the ease with which it can be manipulated. Its extreme softness after annealing permits it to be easily burnished to an irregular surface, so that the operator can produce an exact reverse of the concavity and tuberosity of the lingual surface of an incisor, however deeply marked it may be. Beneath this I place a pad of bibulous paper, which I support with my finger; or I instruct the patient to close the jaws, the lower incisors (where occlusion will permit) holding the matrix in place, allowing me the free use of both hands for the operation.

I have lately, however, perfected a method and mechanical appliance that I look on as one of my most valuable assistants. This appliance transforms a former tiresome and arduous task into a mere pastime. Take, for illustration, the upper right central incisor mesial surface. The decay involves a considerable portion of the lingual wall, the labial wall is also broken. After adjusting the rubber-dam, I take a strip of copper about 30 gage, almost as wide as the length of the mesial surface of tooth, and one or one and a half inches long. After trimming one end oval, I anneal it, and insert between the affected tooth and the left central incisor, allowing the oval end to project beyond the lingual surface about a quarter of an inch, being governed by the extent of the broken wall it is designed to restore, making a liberal allowance for friable margins that will be cut away in the preparation of the cavity. I then bend the lingual end of the strip under the lingual surface of right central, and the labial end over the labial surface of left central. While holding firmly in place with the fingers of the left hand, I press on the labial end of strip, and burnish over the lingual end, easily and quickly obtaining a perfect adaptation to the lingual surface of tooth. The strip is then removed, ordinary care being observed to prevent a change in shape. After removing, the depression caused by burnishing is filled with silver solder. If an abundance of solder has been used, the result will be a matrix that has the combined advantages of solidity, stiffness, cheapness and accuracy. This can then be polished brightly on the surface against which the gold is to be packed, stiff brush wheels and pumice being first used, and then a soft brush with prepared chalk. The cavity is now prepared in the usual manner for filling, after which the matrix is readjusted and held firmly in position by a matrix clamp designed for this purpose, the clamp standing well out of the way, exposing the entire surface of tooth to be filled. After the filling is inserted, and clamp and matrix are removed, the lingual surface will be found highly polished. It rarely requires any further finishing. By the use of these appliances I insert extensive contour fillings for prices that could not be otherwise afforded. Thus gaining not only time, but the gratitude of many patients.

THE DEVITALIZATION OF THE DENTAL PULP.

By W. D. Miller, M. D. Ph. D., Berlin, Germany.

The devitalization of the dental pulp has frequently been made the subject of communications to the dental journals, and of discussions in dental societies. Expression has often been given to the general

complaint that application of arsenic to the dental pulp is too frequently followed by severe pain, and various means have been suggested for rendering that operation less trying to the patient.

My experience in the devitalization of pulps differs somewhat from that of many writers on the subject, in that I am able to perform the operation without pain; at least I have not had a single case in the last two years in which the patient has complained of severe pain after the application of arsenic, and in nearly all cases they have said they had felt nothing whatever. A description of the manner in which I devitalize pulps may, therefore, be of service to some of the readers of the *D. & S. Microcosm.* Not that I employ different materials from anyone else, or use different methods, but I certainly do accomplish the result without pain.

With occasional exceptions, I adjust the rubber dam where arsenic is to be applied, then bathe the cavity thoroughly with carbolic acid, and remove the decayed dentine as thoroughly as possible without producing unnecessary pain. I find it desirable, as others do, to have a large surface of exposure to which to apply the arsenic, but I apply it to a small exposure rather than give the patient pain in the attempt to enlarge it. I now place two or three drops of carbolic acid upon a glass slab, and add as much of the hydrochlorate of cocaine as it will dissolve. A pledget of cotton, supersaturated with this solution, is placed in the cavity and left there while I am preparing the paste. I have in a small bottle a preparation consisting of equal parts of acidum arsenicosum and morphinum muriaticum, with just enough carbolic acid to hold them together (not to make a paste). I take a bit of this a little larger than a pin head, and make a paste of it with the saturated solution of cocaine in carbolic acid. I now remove the pledget of cotton from the cavity, take the paste from the point of a suitably shaped excavator, and apply it directly to the point of exposure. Over this I place a small, flat pledget of cotton, well saturated with cocaine-carbolic acid solution, being careful not to let the cotton extend over the margin anywhere, and avoiding every trace of pressure.

As far as the action of the cocaine is concerned, I have no doubt the same result may be obtained by incorporating the crystals with the ordinary thin arsenic paste usually employed. So far as I know, the following formula, which has been repeatedly recommended, would serve the same purpose.

℞ Acidi Arsenicosi..................................
Cocaine Hydrochlorate.....................aa, 0 5
Acidi Carbolici, q. s.................................

Personally I have always used the fresh crystals of cocaine. Now comes a very important part of the operation, that of retaining the application in position. If I had my enemy in the chair, and wished to make him atone in one night for all the sins he had ever committed, I would take some cotton, roll it up into a hard ball, saturate it with sandarac varnish, and force it into the cavity. The use of cotton and sandarac for retaining applications to the pulp appears to me to be utterly inexcusable. I think that one would be justified in calling it not only irrational, but a slovenly practice. More or less pressure is absolutely necessary to make the cotton stay in place, and this is sure to increase the probability of pain in a high degree, to say nothing of the danger of causing minute quantities of the arsenic to exude and come into contact with the gums, while the cotton itself, unless packed very tight, soon becomes permeated with the secretions of the mouth.

The method of covering applications to the pnlp with gutta-percha has always appeared to me very objectionable, simply because it is next to impossible to cover the bottom of a cavity with a pledget of cotton, supersaturated as it should be with some local anæsthetic, and then fill over this cotton, wet with gutta percha solution, so as to obtain anything like a watertight filling, without exerting pressure upon the cotton. For all cases where we have to enclose applications on cotton, the oxysulphate of zinc is vastly superior to gutta-percha. I use the preparation known as Fletcher's artificial dentine, but am not acquainted with preparations of a similar character which may be on the American market. I mix the preparation moderately thin, so that when it is taken upon the spatula it hangs down slightly. It should not, however, be thin enough to drop off. For inserting it, I use in most cases a very thin sickle-shaped spatula. Taking a small quantity upon the end of the spatula I draw it across the margin of the cavity, just about as one draws a plaster knife across the edge of a board to wipe the plaster off. I thereby fix the cotton on one margin; then in the same manner it is covered on the opposite margin, eventually a third or fourth portion being necessary to complete the operation. For approximal cavities in molars, an instrument being bent upon its surface will sametimes be found preferable to a sickel-shaped one. The method of applying the cement is also somewhat different for molars, but a little experience will soon make the manner of manipulation apparent to everyone. Like everything else, it requires some practice.

With the oxysulphate, or even with plaster of Paris, one can place

a wet pledget of cotton in the open end of a tube ¼ inch in diameter, and fill over it without displacing the cotton, or exerting the least perceptible pressure upon it, a thing which cannot be done with gutta-percha, or any other material that I know of. My manner of applying assenic was put to a severe test a few days ago in two quite similar cases, one of which I may relate. A middle-aged gentleman, of nervous temperament, presented himself, with an aching tooth on the right side of the upper jaw. An examination revealed a second molar, decayed on the distal surface. The cavity contained a pledget of cotton, the removal of which was followed by a paroxysm of severe pain, and a drop of pus was seen to exude from the point of exposure of the pulp. I make it a rule never to apply arsenic to an aching or highly inflamed pulp, but in this case, for special reasons, I decided to deviate from the rule. I at once inserted a pledget of cotton, saturated with the cocaine-carbolic acid solution, which was alllowed to remain about five minutes, the pain gradually diminishing in intensity ; I then asked the patient to rinse his mouth (not a necessary part of the procedure, however,) and renewed the application, which I left in the cavity while I was preparing the arsenic paste. The latter was applied as described above. When I had finished, there was still some grumbling pain, which disappeared gradually and entirely inside of ten minutes, and the patient did not have a trace of pain afterwards. The pulp could be extirpated on the following day. Thus the application of arsenic was made the means of completely stilling the pain, instead of producing the violent suffering so often complained of. In another case, two days ago, a young lady came to me with an aching tooth, which had troubled her more or less every day for weeks. It was so sensitive that the touch of the finger, unless quite warm, produced severe pain. I applied arsenic with my usual care, and from the moment she left my office she felt nothing whatever to remind her that she had a decayed tooth.

I attribute my success in this operation to the observance of the greatest possible delicacy in making the applications to the pulp, in particular to the avoidance of every trace of pressure, and secondly to the maintenance of a constant anæsthetic condition by use of the cocaine-carbolic solution.

HOFF (N. S.) ON LOCAL ANÆSTHESIA.

Cocaine alone is best used in a two per cent. solution in local anæsthesia. The addition of carbolic acid to the distilled water, helps to render the solution antiseptic and also limits the absorption of the

cocaine into the general circulation, thereby localizing its action. If higher percentage solutions are used, some agents which will counteract the paralyzing effect of the cocaine on the heart and respiration should be added. The most effective agent of this kind is the sulphate of atropine. This is a valuable additon to the formula, not only for its antagonistic effect, but it also increases the local effect by paralyzing the nerve endings in the tissues involved.

In order therefore to construct a formula which will meet the demands of anæsthesia and be safe to use, four elements at least are necessary, viz: the basis, the adjuvant, the corrective, the diluent. And as an illustration, we will compound the following formula, making a two per cent. solution of cocaine—

℞ Cocaine Hydrochlorate........ ....gr. x
Sulphate of atropine ....gr. 1-10
Carbolic acid, 95 per cent. solution......gtts viij
Distilled water...dr. j

Dissolve carbolic acid and atropine in the water and to every twenty five drops add one half grain of cocaine. When wanted for use, other drugs may be added to this formula to increase or intensify the effect of the cocaine, but in my judgment chloral, camphor and aconite, which are usually employed, do not materially increase the power of the formula, while it is quite certain that they do cause an excessive irritation that is somewhat difficult to control. Chloral is especially apt to cause this irritation, and in some cases it will produce excessive swelling or even sloughing of the gums. To increase the power of the formula, I should prefer rather to increase the amount of cocaine up to a three or four per cent solution. The amount of this formula that can be safely used at one time can be determined by remembering that one half grain of the cocaine is a safe dose for a dypodermic injection, and that $\frac{1}{200}$ to $\frac{1}{60}$ of a grain of atropine can be safely injected. And since the atropine and cocaine neutralize each other in their physiological actions, a dose of each given at the same time must be safe. The carbolic acid in the quantity indicated is not at all dangerous, and consequently we would be justified in using hypodermically twenty-five drops of the above solution. But practically it will not generally be necessary to use more than ten or fifteen drops, unless a great many teeth are to be extracted. This formula is selected only as a basis or a study, as it were, but it will be found useful in its present form. It is hoped, however, that this subject will be investigated both clinically and scientifically.—*Extract Dental Register.*

THE USE OF ANTISEPTICS FOR STERILIZING CAVITIES BEFORE FILLING.*

By H. A. Smith, D.D.S., Cincinnati, O.

My purpose in this paper is to consider briefly the use of antiseptics in sterilizing carious dentine in deep seated cavities.

It is now regarded as good practice to leave in the bottom of cavities a layer of carious dentine if by its removal the pulp should become exposed. In such cases the continued health of the pulp depends upon the thorough sterilization of the layer. Upon this point, Prof. Black says: "Where we cover in a little bit of softened dentine over a pulp nearly exposed, we may cover in the anærobic microbes. In a short time they may produce products that will destroy the pulp, or they pass through and penetrate into the pulp and infect it. This action is brought about rapidly and the poisonous matter escapes towards the pulp. If we have covered these microbes in with the filling we have sealed up the elements for destroying that pulp. So here we need an antiseptic."

In considering this subject, naturally the first inquiry would be, what chemical or physical changes have taken place in this layer? Dental caries suggests decalcification. The degree to which decalcification has taken place depends upon which portion—the superficial, the middle, or the deeper-seated portion—of softened dentine is under examination. Prof. Miller in his recent work gives the result of his investigations upon the whole mass of softened dentine in the cavity, to a certain the comparative loss of the organic and inorganic constituents. After giving his methods and the result of analysis, he says, "In plain words the carious dentine had suffered an almost complete decalcification—only one thirteenth of the original amount of lime salts being present. The organic matter had suffered the comparative small loss of two-fifths of its original amount. This loss is no doubt attributable for the most part to the direct action of micro-organisms upon the more completely decalcified portions of the carious dentine." Continuing, he says, "The results of these experiments show that the organic matter yields last to the destroying agents." It will be seen, then, the layer of carious dentine which we propose to sterilize, is, more or less, composed of the organic matter which was originally the basis substance of the dentine. Therefore it is albuminous, and if tested, should give an acid reaction.

In selecting an antiseptic for the purpose indicated, the length of time the antiseptic may be permitted to remain in the cavity before

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*Read before the Ohio State Dental Society, held at Columbus.

introducing the filling, should be considered. If only for a few minutes or during the excavation of the cavity, the antiseptic should be one that will not coagulate albumen and one that is quickly diffusible. In some of the oily antiseptics we have those that meet these conditions, preferably the oil of cassia, oil of cloves, oil of turpentine, and eucalyptol. The diffusibility of these oils is conclusively shown by the experiments of Prof. Harlan. His conclusions are also fully borne out by clinical experience. In cases requiring immediate treatment, after thoroughly drying I usually apply oil of cassia and oil of cloves, equal parts. If the carious layer is of considerable thickness would apply oil of cassia alone. The latter being somewhat irritating, the addition of oil of cloves will in a degree modify this action, if liable to come in contact with pulp tissue. Myrtol has been highly recommended by Prof. Harlan because of its being a very pleasant, non-irritant and highly potent antiseptic. Those who believe the ideal antiseptic should be soluble in water, may use carbolic acid, bichloride of mercury, trichloride of iodine, or the latest addition to this class of agents, lysol, a perfectly soluble antiseptic of the cresol group. Of the above, carbolic acid is most frequently used, and I have no doubt that in many cases if permitted to remain sealed in the cavity several hours, from 5 to 10, will effectually sterilize carious dentine. To overcome in part the coagulating properties of carbolic acid, I have been in the habit of using a mixture of carbolic acid one part, oil of cassia two parts, oil of cloves three parts. In cases when a permanent filling must follow treatment at the same sitting I find the above modification of Prof. Black's 1, 2, 3 mixture very satisfactory.

I have already referred to the need of dryness in the antiseptic treatment of this layer of carious dentine. This cannot be too strongly insisted upon. If the layer, especially the upper and more albuminous portion is saturated with moisture, the diffusion of any of the antiseptics would be greatly retarded; besides, if any antiseptic readily soluble is used, its effective strength may be reduced to a degree which renders it inert. In the layer nearest the pulp, where we may suppose caries is still active, the normal tubular structure of dentine is more nearly maintained. These minute tubes are a physical barrier to the diffusion of antiseptics, whether in solution, an oil or an emulsion. And if the moisture which is natural to the protoplasmic contents of the tubules, or to the micro-organisms in them is not removed in greater part, the diffusion of the antiseptic is still further interfered with. How may we obtain this dryness? By bathing the

layer with an agent which has an affinity for water, as alcohol, and evaporating it with warmed or heated air.

The methods practiced to obtund sensitive dentine by dehydration are usually efficient, and if carefully followed out, by the time the cavity is prepared, we will have desiccated the layer of carious dentine in the bottom. The use of alcohol for this purpose may be objected to because of its coagulating effects upon albumen. This property, however, would be very slightly exhibited, because of the rapidity with which it would be evaporated by the hot air blast.

It may be in order in this connection to refer to a class of cases in which caries recurs after the tooth is filled, because of some defect at the margin of the cavity. Caries advances along the wall of the cavity until the bottom is reached. Here we find a softened portion of dentine extending partially under the filling. Often, because of the difficulty in reaching this diseased portion, the filling is removed and the whole operation done over. This in some instances may be avoided provided the layer of carious dentine beyond the reach of the excavator can be sterilized. To accomplish this the whole of the softened dentine must be thoroughly dried, the antiseptic applied and the opening carefully sealed for a day or two, after which permanent repair of the filling may be made.

It may be said lack of thoroughness in the removal of carious dentine, begets carelessness in our method of practice, and yet, if partially decalcified dentine on the walls of the cavity well away from the margins, may be made fixed matter, why may it not be left?

In the class of cases above described, the difficulties in sterilization increase in proportion with the increase in thickness of the layer of softened dentine under treatment. For this reason, and because of a lack of knowledge of the relative potency of the various antiseptics we use, it would be well, perhaps, to restrict their application to the sterilization of layers of carious dentine left in the bottom of cavities for pulp protection.—*Ohio Journal Dental Science.*

BOOK NOTICES.

LETTERS FROM A MOTHER TO A MOTHER, ON THE FORMATION, GROWTH AND CARE OF CHILDREN'S TEETH. Fourth edition. By the wife of a dentist, "Mrs. W. W. I.," Honorary Member of the Southern Dental Association, and of the Mississippi, Alabama and Georgia State Dental Associations. Publishers: The Washington Dental Mfg. Co., No. 1413 Filbert st., Philada., 1893.

This little work has become a standard publication. Many dentists have made arrangemenis with the publishers whereby it may be

supplied them at wholesale rates and in this way are enabled to *present copies to their patients*, and thus disseminate the truths it contains. It is a popular work, written in eloquent language, and contains a fund of information, told so fascinatingly, that all who take it up read it through to the end with interest. It is a book that should be in the possession of all prospective mothers.

PRACTICAL PLACE.

A Gentleman.

When you have found a man you have not far to go to find a gentleman. You can not make a gold ring out of brass. You can not change a Cape crystal to a diamond. You can not make a gentleman till you first find a man. To be a gentleman does not depend upon the tailor or the toilet. Blood will degenerate. Good clothes are not good habits. A gentleman is gentle, modest and courteous; he is slow to take offense, as being one who never gives it; he is slow to surmise evil, as being one who never thinks it; he subjects his appetites, refines his tastes, subdues his feelings, controls his speech, and deems everybody better than himself.—*Anonymous.*

The chemical action of oxyphosphate in hardening softened dentine, specially adapts it for soft teeth. When the dentine has softened quite to the pulp, so that its laminations can be readily laid with the instruments in layers, by all means let it remain undisturbed, rub on a little tannin made into a thin paste with oil of cloves, and fill with phosphate of zinc. The softened dentine soon becomes "tanned," and a permanent covering made for the pulp.

Chloride of Ethyl, says Dr. George E. Hunt, has proved itself a local anesthetic of considerable value. It comes in ten-gram flasks, and it is so volatile that it is difficult to save any when once the flask is opened. For lancing abscesses, extracting teeth, etc., when a general anesthesia is not desirable, it is of great value.

"Make a saturated solution of zinc sulphate in water," says the *Dental Review*, "and use it with the powder in oxychloride packages and see how hard it will become." Its use in pulpless tooth crowns, and as a foundation for filling, is highly satisfactory.

"In filling deciduous teeth," says Dr. S. E. Gilbert, in the *Cosmos*, "it is often almost impossible to exclude moisture from the cavity

sufficiently to permit filling with zinc phosphate, unless the rubber dam is used. The difficulty may be overcome in the following manner: Place some of the powder in a glass slab, also a little of the fluid, and besides these a little of chloro-stopping. Make a rather thin mix of the zinc phosphate, then add to this the chloro stopping, mixing in more of the powder till a thin putty-like consistency is obtained; now napkin the mouth, and dry, immediately packing to place, and finishing with burnishers."

THE pain that occasionally occurs so acutely after the extraction of a tooth appears to be a centralizing of nerve force in the cavity, possibly from the extension of the nerve sheath before giving away. "This pain," says Dr. Wilson, "is instantly cured by a strong sniff of ammonia."

The Pharmaceutical Record gives the following form for an Antiseptic Dental Cream:—

Precipitated chalk	drachms v
Powdered white soap	drachm j
Salicylate of soda	grains xx
Oil of rose geraneum	m. iv
Oil of wintergreen	m. iij
Solution of carmine	m. ij
Glycerine (4) } Water (1) }	q. s.

Triturate the powders, add the oils and continue trituration until well mixed, then make into a paste of the desired consistency with glycerine and water mixed in the above proportions, add the solution of carmine, and rub all together until a smooth creamy paste results.

This makes an elegant dentifrice, and should be put up in white porcelain jars, or made more of the consistency of honey and put in tinfoil tubes.

CROWNING FRAIL ROOTS.

A narrow band is fitted around the neck of any root, a cap placed on the top of that, and a pivot fitted in the root and through the cap, the whole being then soldered together. One or two vent holes are then drilled through the top of the cap and is set to place with oxyphosphate, the excess coming out through the holes. These holes are then reamed out and filled with gold, and the edge of the band under the gum is burnished to the root. The tooth is then fitted to this cup and set on the projecting pivot with oxyphosphate. The

advantage of this plan is that the root being slightly tapered with proper paring instruments, the band can be made to fit absolutely, while the excess of oxyphosphate is gotten rid of through the vent holes instead of being squeezed out around the edge of the band. The crown used is similar to the Howland crown. Another method employed with these, as well as the old fashioned pivot teeth, is to prepare the root even with the outline of the gum, and set a pivot into it with oxyphosphate. The end of the root is cut very smooth and even and the base of the crown accurately fitted. A mat is made of several thicknesses of soft gold No. 5, and a clean hole cut in the centre of it, of the size of the pivot. It is then put over the pivot as a washer, and the tooth set with oxyphosphate. If in time the cement wastes, the gold remains to preserve the root.—Dr. S. G. Perry, in New York Odontological Society, reported in the *Cosmos.*

Holmes (A. M.) on the Preparation of Canada Balsam for Cavity Lining.

I have found that when cavities are painted with Canada balsam cut in chloroform it not only serves as a retainer, but the chloroform evaporating, there is left a hard, impervious coating between the filling and the tooth, which effectually closes the mouths of the dentinal tubuli, and forms a non-conductive layer that very materially modifies shocks from thermal changes. In preparing it, evaporate the balsam to the point of dryness, and then dissolve it in enough of chloroform to reduce it to the proper consistency. Do not allow the Canada balsam solution to coat the cavity quite to the edges of the walls.—*Practitioner.*

M. Chamberland, one of Pasteur's colleagues, says that no living disease germ can resist for more than a few hours the antiseptic power of essence of cinnamon.

To Protect Fillings of Oxyphosphate.

Cut and file a piece of gold plate of the size and shape of the surface of the cavity. Now solder to its under surface the center of a narrow strip of gold and bend up the ends. As soon as the filling is placed in the tooth and while it is soft, press this cap on the surface.

A gutta-percha filling may be made quite durable in this way, though of course the cap must be pressed on while hot.

"The New Remedy," says Dr. C. N. Peirce, "tri-chler-acetic acid, is an excellent counterant. If a piece of wood dipped in it be thrust

into an alveolar pocket it will dissolve every vestige of any deposit. It has a happy effect on the tissues themselves; if it be thrust into septic roots it acts better than carbolic acid."

Personal health, which makes one unacceptable or disagreeable, demands careful attention. Bad breath is especially disagreeable, and can generally be avoided. When a disagreeable breath results from objectionable and filthy habits, it ought not to be tolerated for a moment by any self-respecting person.

A well known dentist was called on by a colored girl for some dental treatment, and because of the careful toilet preparation he made before and during the treatment, he so impressed the girl that she related the fact in the wealthy home where she lived, and as a result, a large and wealthy connection became the dentist's patrons. —J. Taft, in *Ohio Journal.*

A single drop of nitro glycerin, 1 per cent. solution in half a glass of cold water, is said to be a reliable remedy for the after pains of tooth extraction. Amyl nitrate (Powers & Weightman, Rosengarten & Sons) is also another reliable remedy. Both remedies are of "marvelous benefit," says E. H. Brown, M. D., "in neuralgias of all kinds, and both will oftentimes cure the bad headache following dental operations."—*Exchange.*

Thin Rubber Plates.

To secure the maximum strength without increasing the thickness of vulcanite plates it is necessary to make the mold so smooth that the rubber, when removed from the plaster, needs only the brush wheel to finish it. To accomplish this, first saturate the model with water, then dip it in a vessel of clean melted base plate wax.

Cocaine hydrochlorate,........................ gr. 20.
Sulphate of atropia,......... ....gr. 1-10.
Carbolic acid, crystals,................. ..... gr. 10.
Chloral hydrate,..................................gr. 5.
Aqua pure, add one ounce.

Recommended by Dr. Wasson as an injection for the painless extracting of teeth.

The composition of gold solder must depend on the alloy of the plate. A good solder for coin gold is 2 dwt. gold, 9 grs. copper, 3

grs. silver, and 1 gr. zinc. With care 18 karat gold can be soldered with this, and it is better than a heavy grade. A softer solder may be made of gold 2 dwts., copper 8 grs., silver 5 grs., and zinc 5 grs.

A good silver solder is 1 part of zinc, 3 parts copper, and 16 parts silver. One flowing much easier may be made of zinc 5, copper 8, and silver 48.

It is singular that copper, which requires a much greater heat to melt than silver, will, when added to the silver, cause both to melt at a lower temperature than either will melt when alone.

Local Anæsthetic for Extraction of Teeth or Pulps.

℞ Cocaine hydrochlorate,........................grs. v.
Acid carbolic xtals,...........................grs. iv.
Gum camphor opt,.............................grs. vi.
Glycerine, pure, ...grs. xv.
95 per cent spts. vini Rect. Q. S. add....drs. ii.

Hypodermic syringe. Inject one or two drops deeply into the gums on inner and outer side of the tooth, and apply over the gums around the tooth, also in cavity of tooth, a piece of absorbent lint or cotton wet in the solution. Wait four or five minutes (by the watch) and the gums can be freely incised and tooth extracted with but little pain.—*Exchange*.

Food and Sleep.

Going to bed with a well-filled stomach is the essential pre requisite of refreshing slumber. The cautions so often reiterated in old medical journals against late suppers were chiefly directed to the bibulous habits of those early times. When at late feasts the guests not unseldom drank themselves under the table, or needed strong assistance to reach their couches, the canon against such indulgence was not untimely.

Nature and common sense teach us that a full stomach is essential to quiet repose.

Every man who has found it difficult to keep awake after a hearty dinner has answered the problem for himself. There are few animals that can be trained to rest until after they are fed. Man, as he comes into the world, presents a condition it would be well for him to follow in all his after life.

The sweetest minstrel ever sent out of paradise cannot sing a newly born child to sleep on an empty stomach. We have known reckless nurses to give the little ones a dose of paregoric or soothing syrup in

place of its cup of milk, when it was too much trouble to get the latter, but this is the one alternative.

The little stomach of the sleeping child as it becomes gradually empty, folds in it elf in plaits; two of these make it restless, three will open its eyes, but by careful soothing these may be closed again; four plaits and the charm is broken; there is no more sleep in that household until the child has been fed.

It seems to us so strange that, with this example before their eyes, full-grown men are so slow to learn the lesson. The farmer does it for his pig, who would squeal all night if he were not fed at the last moment, and the groom knows that his horse will paw in his stall until he has had his meal. But when he wishes to sleep himself he never seems to think of it.

To sleep, the fullness of the blood must leave the head; to digest the eaten food the blood must come to the stomach. Thus, sleep and digestion are natural allies; one helps the other. Man, by long practice, will train himself to sleep on an empty stomach, but it is more the sleep of exhaustion than the sleep of refreshment.

He wakes up after such a troubled sleep feeling utterly miserable until he has had a cup of coffee or some other stimulant, and he has so injured the tone of his stomach that he has little appetite for breakfast. Whereas, one who allows himself to sleep after a comfortable meal awakens strengthened, and his appetite has been quickened by the preceding indulgence.

The difficulty in recovery comes from the fact that we are such creatures of our habits that it is impossible to break away from them without persistent effort. In this case the man who has eaten nothing after 6 o'clock, and retires at 10 or 11, takes to bed an empty stomach, upon which the action of the gastric juice makes him uncomfortable all the night.

If he proposes to try our experiment, he will sit down and eat a tolerably hearty meal. He is unaccustomed to this at that hour and has a sense of discomfort with it. He may try it once or twice, or even longer, and then he gives it up, satisfied that for him it is a failure.

The true course is to begin with one or two mouthfuls the last thing before going to bed. And this should be light food, easily digested. No cake or pastry should be tolerated. One mouthful of cold roast beef, cold lamb, cold chicken, and a little crust of bread will do to begin with, or, what is better yet, a spoonful or two of Borden's condensed milk (not the sweetened that comes in cans), in three times as much water. Into this cut half a pared peach and two

or three little squares of bread, the whole to be one-fourth or one-sixth of what would be a light lunch. Increase this very gradually, until at the end of a month or six weeks the patient may indulge in a bowl of milk, two peaches, with a half hard roll or a crust of home-made bread.

When peaches are gone take baked apples with the milk till strawberries come, and eat the latter till peaches return again. This is the secret of our health and vitality. We often work until after midnight, but eating the comfortable meal is the last thing we do every night of the year. This is not an untried experiment, or one depending on the testimony of a single witness.—*N. Y. World*

Richards (W. H.) on Obtaining the Exact Quantity of Rubber for Packing.

Take a level board and tack to it two strips of wood of the thickness of the rubber to be used, and about as far apart as the width of the rubber; make a rolling-pin out of a straight round broom handle, save all the wax from the case, warm it and roll out on the board until the pin touches the strips; the wax is now the thickness of the rubber; lay the wax on the rubber and cut the rubber the shape of the wax.—*Catching's Compendium.*

The Rubber Bridge.

I have a system of bridge-work which I term a rubber bridge. I construct it as follows: Proceed as in the gold bridge. I will take for example the four upper incisors. I make what is known as the window crown for the two cuspids. To these I solder a platinum barbed bar from one crown to the other. It is now ready for fitting on. I use plain or gum teeth as may be demanded. Articulate and try in the mouth, and if all right take the impression of it in position, after which make a cast of it, and you will find the work as it was in the mouth. Now flask as for a rubber plate, scald out all wax, pack in rubber and vulcanize. Take out and polish and cement on, as in a gold bridge.

There is nothing in the construction of the work new except rubber is used instead of solder and the gold, and its advantages over the gold bridge are these:

First. It can be made much cheaper.

Second. You avoid all liability of checking the teeth.

Third. You use such teeth as are used in rubber plates, and gold is not exposed to view.

Fourth. Should a tooth break it is easily repaired.

I have made many of these bridges, and my patients like them better than the gold bridge.—A. S. Phillips.

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[NINETEENTH PAPER.]

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

MATERIA MEDICA (Continued from page 135, Vol. vii, No. 5.)

DOVER'S POWDERS.

This medicine is administered for colds. It is generally prescribed at bed time with a view of producing perspiration, and in this way relieving the congestion caused by the cold. 10 grains is the dose. It is also prescribed to produce sleep, thereby relieving the pain produced by pesidental inflammation in incipient alveolar abscess.

ETHER.

This medicine is obtained by the distillation of alcohol and sulphuric acid, after which it is rectified by distilling again with a solution of potash. It is a white, colorless liquid, with a strong odor and a pungent taste. It evaporates very quickly, and is quite inflam able, so it should be used with care where there is a burning flame. It boils at 98° F., and a cold as low as 166° below zero will not freeze it. Its ready evaporation makes it useful as a local anæsthetic when used in the form of a spray or atomizer. It is useful in cramps, colic, flatulence, hysteria, syncope, &c. The dose $\frac{1}{2}$ to 1 drachm in sweetened water. In dentistry it is used as a solvent for drugs which will not dissolve in water, such as iodoform ; also as a counter-irritant, and in stomatic and apthæ. It is also used as a general anæsthetic by inhalation in the same way as chloroform.

EUCALYPTUS.

This material is obtained from a tree of a large size, which grows in Australia, but it has been introduced and now flourishes in the southern parts of the United States and Europe. It is known popularly as "The Blue Gum Tree," and seems to thrive better in low or swampy lands, and is esteemed because of the belief of its being a

preventive of malaria. The leaves have a pleasant odor, and when chewed, a pungent, pricking, warm taste. From the leaves an oil is obtained of which use is made. The oil contains tannic acid, but eucalyptene is its most important constituent.

Its properties are tonic, sedative, antiseptic and disinfectant.

The use made of this in dentistry is to obtund the sensitiveness of the dentine, to treat alveolar abscess and putrescent pulp either alone or combined with iodoform, to treat pyorrhea alveolaris, ulcers of the muceos membrane, and indolent sores of the mouth. In the latter cases it is used in the form of tinctures or washes—in the former by local application in the form of the oil.

ACETATE OF MORPHIA.

It will be useless to tell how the acetate of morphia is obtained, as few dentists would make it. But to know generally about it we will say it is obtained by precipatation, when it appears as a kind of cream colored powder. It is soluable in water and has a bitter taste. It is used by the dentist as an obtundent of sensitive dentine, and for relieving the pain after tooth extraction. It is, however, more generally applied to relieve toothache proceeding from an exposed or a nearly exposed pulp, prior to the application of arsenic. For this purpose it is very effective, seldom failing to give relief or to quiet and irritated pulp. It is applied thus: A quantity of the powder, as much as will lay on the end of the small blade of a pen knife is put on a glass slab, and this is mixed with carbolic acid, oil of cloves, or cinnamon oil. A few shreds of cotton is worked into the mixture, and the minute pellet is placed in the cavity. It is retained with another pellet of cotton or with some adhesive wax or temporary stopping.

ALUM.

The sources of alum are from alumstone, found in large quantities at Tolfa and Picmbino in Italy. It is this mineral which forms the basis of the metal aluminum. It is white and semi transparent and forms in eight-sided crystals. It has an acid taste and is very astringent. It has been used as an ingredient of tooth-powder, but reprehensibly, as it contains traces of sulphuric acid, which, though it may whiten, is hurtful to the teeth if constantly used. It is employed by the dentist as a strong astringent in wash or in powder for stopping the bleeding from the sockets of extracated teeth. Or when the gums are made sore from too great pressure, or cutting of an artificial plate, powdered alum applied to the sore spot will cure the sore and harden the gum. The plate of course should be relieved

at the point causing the sore. It is one of the principal ingredients for gargles for sore throat or a sore mouth of any kind, and is largely used combined with Labaraque's solution as a bleaching agent for discolored teeth.

BORAX.

This exists in its native state and is found in several localities in Europe, in Peru, and in Equidor; but it may be produced by artificial means. It is used by the dentist, combined with honey and alum, for the ulcerations sometimes found on the mucous membrane of the mouth. It is sometimes used as a component of tooth-powder, and has been recommended to counteract the acidity and wasting noticed in the teeth of pregnant women. It is useful to dip such instruments in as are used in the treatment of putrescent pulps or alveolar abscess, as it stuitizes them. It is employed in the dental laboratory as a flux for gold and silver solder, also as a flux in melting gold. If a solution of borax be made with boiling water, and plaster models that have been well dried be immersed in this solution for a few moments, the model is made very hard by the process.

PER OXIDE HYDROGEN.

This substance was discovered by Thenaid in 1818, but it is only recently that its efficacy as a remedy has attracted attention, principally through the efforts of Dr. B. W. Richardson, of London, who described its therapeutic effects.

It is a valuable remedy to the dentist in the treatment of alveolar abscess, putrescent pulp, and pyorrhœa alveolairs, for ulcerations of the mucous membrane of the mouth, fungous growths, bleaching teeth, &c. The absence of all odor in the medicine makes it more desirable than many medicines used for the same purposes. In the treatment of alveolar abscess or putrescent pulp it is pumped into the root canal by means of a probe wound, with a few shreads of cotton to form a piston, or it may be injected by means of a Dunn or Farrars abscess syringe.

For bleaching discolored teeth the rubber dam is applied and the canal well washed with it, after which a small quantity of the chloride of alumina is placed within the cavity or root canal, and this moistened with the per oxide, which is permitted to remain a short time and then washed out with a solution of borax and water. The process may be repeated as the tooth shows improvement in color.

PHENOL SODIQUE.

This remedy is made by mixing carbolic acid with caustic soda.

It is used by the dentist as a styptic wash after the extraction of teeth, as a mouth wash for sore gums and foetid breath, and likewise for hardening the gums under plates supporting artificial teeth. It relieves toothache when caused by an exposed pulp, by applying it on a pellet of cotton to the cavity of decay. It is really the phenate of soda, but is most generally called by French name "Phenol Sodique." The dose internally is from 8 to 10 drops in a glass of water, and it is regarded a good febrifuge, and a remedy both for cholera and summer complaint (or cholera infantum) of children.

CAMPHO PHENIQUE.

Campho phenique is a clear fluid, having an aromatic taste and strong odor of camphor. It is the chemical union of carbolic acid and camphor. It is a germicide, a local anæsthetic, obtundent and antiseptic. It is non-irritant and non-poisonous, and is recommended to the dentist for use in lieu of the bi-chlo-mercury as a pulp canal dressing. It is used in lieu of carbolic acid, oil of cloves, iodoform, &c., and as an obtundent for sensitive dentine, also to allay the soreness incident to the separation of wedged teeth and for the after pains of extraction. It may be mixed with arsenic for the devitalization of the pulp, or with morphia for the relief of toothache.

CALENDULA.

Calendula is known popularly as the "Marigold," a common plant. Its odor is not agreeable and its taste is salty and bitter. It is not generally used by dentists, but it acts most benignly when applied to wounded surfaces. A pulp exposed either from the effects of decay or by the accidental cut of an excavator is almost instantly relieved by an application to it of the tincture of calendula. It is useful too in allaying the pain caused by an irritated pulp, though not exposed. The soreness of the gums, incident to the removal of the salivary calculus, is greatly relieved by a wash made from a few drops of the tincture in a quarter tumbler of water.

CAUSTIC POTASH.

This medicine is prepared by boiling liquid potash continuously until it solidifies, when it is cast into suitable moulds on pencils. It attracts moisture readily from the atmosphere, so that it should be kept in ground glass stoppered bottles. The form in which it is most generally purchased is in that of sticks about the size of a lead pencil. Its color is a cloudy white semi-transparent, when pure; but of a grayish or bluish white when impure. It is soluble in alcohol as also in water. It is the most powerful caustic and escharotic used in

medicine, and is rarely, if ever, administered internally, and if taken internally by accident is a most corrosive poison. It destroys the parts to which it is applied externally much deeper than the nitrate of silver, and its use should be with the greatest caution.

It is employed in cases malignant, growths, ulcers of the gums, gangrene of the mouth, and for abscesses when the lancet is not indicated to open these. To prevent its coming in contact with other parts, these should be well protected by a napkin when it is used. Equal parts of caustic potash rubbed together with carbolic acid forms a medicine most effective for the obtundity of sensitive dentine, and many operators report great success with this as an obtundent for this purpose. It has also been incorporated with arsenic, as a painless pulp devitalizer.

CHLORIDE OF LIME.

The chloride of lime is made by passing chlorine gas over slaked or hydrate of lime until the lime becomes thoroughly impregnated with the chlorine. It absorbs moisture from the air readily when exposed, and should therefore be kept in well protected bottles or cans. Its taste is burning and bitter, and its odor that of chlorine. Its appearance that of lime or whitish gray powder, having a moist look.

Its use by the dentist is for cancrum oris, a gangrenous stomatis characterized by deep foul ulcers of the lips, cheeks, and mucous surfaces of the mouth. It is applied in the powder to the ulcer by means of a pledget of cotton held in the tweezers, or it may be carried to the point by the end of the finger, and after a moment, to give the drug the time to act, the mouth should be immediately and thoroughly washed with water. It is efficient for fetor of the breath in the form of a mouth wash by mixing it with mucilage and distilled water. Its principal use to the dentist is as a bleaching agent for dead discolored teeth. It should not be used for this purpose with steel instruments. The best quality of this drug should be used for the purpose, and the tooth operated on should be isolated from the gums and lips by means of the rubber dam. After the cavity and nerve canal are well cleansed, dry chloride of lime, which had been combined with dry tartaric acid, is introduced, until their cavities are nearly full. Equal parts of these drugs are used.

The cavity is quickly stopped with a gutta percha filling, or an oxychloride of zinc filling, so that the liberated gas may force its way into the tubes of the dentine, and thus exerts their bleaching properties. In the absence of tartaric acid, chloroform has been suggested to mix to a paste with the chloride of lime, and the same procedure

observed. The foramen at the end of the root should be sealed before the treatment is begun. Several applications of this treatment may be necessary before the object is effected. When it is, the bulk of the cavity may be filled with oxychloride of zinc, and over this a gold filling.

CHLORAL.

Chloral is made by the action of dry chlorine gas on absolute alcohol, and is afterwards purified by sulphuric acid and lime. In large doses it is poisonous, but in small doses it produces a refreshing sleep. Its action is generally proceeded by a short period of excitement. It should be used with great caution, even in small doses, and never when the patients are suspected of heart disease or lung trouble. Its use to the dentist is for the relief of toothache, the result of inflamed pulps ; for foul fetid breath and indolent ulcers in the form of a wash. It enters with cocaine into the composition of most of the local anæsthetics now offered for sale. It acts as an anodyne, producing a quiet sleep, in cases of the distressing pain from periodontitis.

OIL OF CINNAMON.

The oil is obtained from the bark (called "cassia bark," and is known also as "oil of cassia,") by distilation, and is of a light yellow color, but the action of the light turns it a dark red or brownish color. It is burning to the taste but has an agreeable odor, and from its decided aroma is used to overcome the disagreeable odor of iodoform and other drugs. In large doses it is a poison, and produces inflammation of the intestines and mucous surfaces of the stomach. It is more used at present than formerly. Its odor is more agreeable to most persons than carbolic acid, and investigation proves that it is a most decided germicide. It is used also for the relief of toothache, and combined with iodoform—whose odor it effectually conceals—for the treatment of pyorrhœa alveolaris. It enters into the composition of toothpowder, both in the form of oil, or in the powder made from the bark, as also for toothwashes.

IODIDE OF ZINC.

This is made by saturating water with iodide and digesting the zinc in it. It has the appearance of whitish, or slightly yellowish powder, partaking the form of long crystals. It dissolves very easily in water, and deliquesces by absorbing moisture from the atmosphere. It is tonic in its action, and very astringent, and has a metalic taste, and by some is regarded a better obtundent for sensitive dentine than

the chloride of zinc. It is a valuable application to a tumified condition of the gums, when these have been freely depleted, as also as an application for tumors of the mouth, and for the enlargement of the tonsils. It has been used with per-oxide of hydrogen in pyorrhea alveolaris with success

(CONCLUDED IN OUR NEXT ISSUE.)

[SEVENTEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

Q. Which material fills most ot the requirements of a perfect filling material?

A. Gold foil.

Q. Under what forms is gold manufactured for filling teeth?

A. In the form of thin leaves, termed foil, and in the form of sponge or crystal gold.

Q. Is all gold foil the same?

A. No Some foil is non-cohesive, and by a secret of manufacture will not cohere, while other foils are termed cohesive foils, and the leaves readily cohese on slight pressure, especially when freshly made and when not acted on by the air.

Q. How is it that the books containing gold foil are variously numbered?

A. The number indicates the weight of each sheet. Thus a sheet of No. 4 foil should weigh 4 grains, a sheet of No. 6 should weigh 6 grains, a sheet of No. 10 should weigh 10 grains and so on.

Q. How is gold foil prepared?

A. From absolutely pure gold.

Q. How is this obtained?

A. The gold is commonly supposed to be dissolved in what is termed aqua regia, which is a mixture of one part of nitric and four parts of hydrochloric acids. This dissolves the gold and copper, while the silver which may have been in the nugget is precipitated to the bottom of the vessel in the form of a white powder. The solution of gold and copper is now carefully decanted into a solution of proto-sulphate of iron. This seizes the copper, and the gold is precipitated in the form of a reddish powder. This precipitate is well-digested in hydrochloric acid and boiling water, when it is collected and melted and cast into ingots, and passed through the rolling mill. It is then cut into pieces an inch wide and long, and hammered

between gold beaters' skin until reduced to the necessary thickness The foil is then trimmed and annealed, and placed into books ready for the dentist's use.

Q. You spoke of placing the metal gold in the acids, termed aqua regia; can you tell me which is active and which passive, the acid or the metal. In other words does the acid act on the metal, or the metal on the acid?

A. The metal acts on the acid.

Q. What is your definition of a metal?

A. A metal is a substance capable of acting on, and liberating one or more atoms of hydrogen in an acid.

Q. And what is an acid?

A. An acid is a substance, which when brought in contact with a metal, decomposes with the product of hydrogen gas, and the salt of the metal which produced the decomposition.

Q. You said that the gold after being passed through the rolling mill and cut into squares, was placed between gold beater's skin, and a number of these pieces are tied into what is called a clutch and hammered into foil by the gold beater. Now, what is gold beaters' skin?

A. It is a thin skin taken from the intestines of the ox, generally from the recta or last of the intestines.

Q. How is crystal or sponge gold made?

A. The precipitate of gold is combined with mercury. A perfect crystallization is made by combining from six to twelve times its weight of mercury, when it should stand a short time, and then subjected to a gentle heat. The mercury is then removed with weak nitric acid, after which the nitric acid is washed away from the gold and the gold heated to redness in a muffle, when it is ready for use by the dentist.

Q. What is the system for the use of non-cohesive gold?

A. Entirely by the wedging system. The cavity should have complete circumscribed walls, and should be slightly larger within than at the orifice. Each pellet or cylinder is pressed against the other until the cavity is full. The gold is then perforated by a plugger, and the cavity made by the plugger is filled, and this manipulation is continued until the gold becomes so dense that no farther indentations can be made into the gold by the plugging instrument.

Q. What is the system of cohesive gold?

A. This depends upon the cohering of one particle of gold to the other, and its use is not limited to the circumscribed walls of the

cavity; but suitable grooves, pits and undercuts must be made to retain the filling, and the first piece of gold should be immovably fixed, in order that the successive pieces may be made to cohere to it.

Q. Who first called attention to this form of gold?

A. Dr. Robert Arthur, of Baltimore, Maryland.

Q. Did he merely call attention to this property of gold?

A. Not only this, but he devised instruments for the proper working of it.

Q. What is the difference in the instruments for working non-cohesive and cohesive gold.

A. Smooth points are used for non cohesive gold, while roughened or serrated points are used for cohesive gold.

Q. Why are the instruments for this gold serrated?

A. As the serrated point of the plugger is pressed into the foil, it leaves the impress of the serrations on it, and this serves as an attachment for the next piece, and thus the filling is built piece by piece until the cavity is entirely filled or the form of the tooth entirely restored.

Q. Is there any particular manner of working crystal or sponge gold?

A. This is a cohesive gold and it is manipulated the same as cohesive gold. Small particles are, preferably, torn from the cake and introduced into the cavity piece by piece.

Q. What should be particularly observed in the use of this gold?

A. The employment of large pieces. No piece should be in-introduced that required to be forced or crowded into the cavity.

Q. How is tin foil regarded as a material for filling teeth?

A. Tin foil has stood the test of time as both a tractable and preservative material for filling teeth. It is easy of introduction into a cavity, soft and cohesive, and in places not subject to the attrition of mastication has been known to preserve a tooth from farther decay for many years. It is not so good a conductor of heat or cold as some other metals.

Q. What are the objections to its use?

A. It is too soft to be employed on the masticating surfaces of the teeth, although even there it lasts for a long time. It is acted on by the fluids of the mouth and discolors, not remaining bright as when first introduced.

Q. Is it ever regarded as superior to gold foil?

A. In soft or highly organized teeth it is esteemed more favorably than gold foil. For the filling of children's teeth it is also favorably

esteemed. But it is often and very valuably employed in conjunction with gold foil.

Q. How do you mean in "conjunction with gold?"

A. A sheet of tin foil is placed between two sheets of gold foil, and in this way the gold is formed into ropes, pellets, cylinders, mats or ribbons, and thus used, at the pleasure of the operator, to fill the cavity.

Q. Is it always or only thus used in conjunction with gold?

A. No. From its superior preservative qualities, it is sometimes placed at the cervical margins of proximal cavities, where decay is most likely to recur, and gold built upon it?

Q. Does gold cohere to it?

A. It does, but there is not that strong affinity or coherence between the particles as in gold alone. It does not weld as perfectly.

Q. How is tin foil used, by the non cohesive or wedging plan?

A. Generally by the wedging system, although particles of tin foil may be built out as a contour gold filling is done, but as the coherence is not so good as that of gold it is seldom used in this way.

Q. What material is probably more extensively used for filling teeth than any other?

A. Amalgam.

Q. What is amalgam?

A. It is an alloy of different metals, principally of tin and silver, almost in equal parts. But gold, copper, platinum, and zinc also enter, sometimes, into its composition.

Q. How is it prepared for the dentist's use?

A. These metals, according to the metalurgists experience, are melted together and cast into an ingot. The ingot is then either placed into a lathe and cut up into fragments or flakes, or it may simply be filed into filings. In either case it is mixed with a certain proportion of quicksilver and formed into a plastic mass. The excess of quicksilver is squeezed out with heavy flat-nose plyers by placing the pellet between a piece of chamois skin, and in this way it is packed, in small pieces, with suitable instruments into the cavity.

Q. How is amalgam regarded as a filling material?

A. Most favorably. It has been known to preserve teeth for many years where gold could never have been employed.

Q. What are its advantages?

A. It is easy of introduction, tractable, preservative, and may be built out to restore the contour or lost portion of the teeth. It is hard,

and resists the wearing of mastication. It is cheap, and therefore a boon to those who cannot afford to pay for gold.

Q. What are its disadvantages?

A. It seems to expand, so that a bulging from the margins of the cavity is noticed. It discolors from the acting of the fluids of the mouth on it. It is so rigid (though not more so than gold) that when placed in contact with enamel, which is not supported by dentine, this tissue is often broken away from the filling necessitating repair at these parts. It is a good conductor of heat and cold, but not so great as gold.

Q. How is it recommended to prevent some of these disadvantages?

A. Where the decay has been so extensive as to leave the enamel unsupported by dentine it has been recommended to line the entire cavity with phosphate of zinc filling material, and when this hardens to scrape away sufficient of this so has to leave the weak enamel supported by this cement. And when there is but a thin covering of dentine over the pulp, to place a wafer or gutta percha, or cement over this nearly exposed point, in order to prevent thermal shock.

Q. What kind of instruments are used to manipulate amalgam?

A. Generally ball burnishers, or instruments especially made for the manipulation of this material called "amalgam pluggers?

Q. What should be some of the qualities of amalgam?

A. It should mix smooth with the quicksilver, it should not discolor, it should neither contract or expand, it should set reasonably hard in ten or fifteen minutes, it should not be granular after it has set, it should have good edge strength.

Q. How should the cervical points of the cavity be treated?

A. This point should be carefully smoothed so that there will be no protrusion of the material, particularly at this point.

Q. How is this accomplished?

A. It may be accomplished by passing a piece of ligature silk, gilling thread, thin tape, or a narrow strip of rubber dam between the teeth, and giving to this a sawing motion, so as to remove all protruding particles from these parts, or it may be removed with a very thin scaler, or a fine Swiss broach passed between the teeth at their necks, so that all excess of material is removed.

Q. Should amalgam have any other treatment before being introduced into the cavity?

A. Some operators favor its being washed in alcohol, or in a solution of bi-carb. of soda and water; but opinion and practice is very

much divided on this point. While much of the quicksilver should be expressed, this should never be carried to such an extent as to make the pellet crumbly or powdery.

Q. Where does amalgam serve a particularly good purpose?

A. In the filling of cavities that are very difficult of access, and where it would be doubtful if a perfect gold filling could be introduced by the most skilful operator. Also where healthy roots remain, which can be made servicable by banding these with platinum and filling within the band with amalgam. Such an operation has rendered many apparently useless roots very servicable to their possessor.

Q. What should be the subsequent treatment of amalgam?

A. After the filling is introduced, the patient should be directed to call in two, three or four days, when the amalgam filling should be made smooth by grinding and polishing it with suitable wheels, disks and buffs in the dental engine.

CORRESPONDENCE.

A New Method for Cutting off Teeth Where They are to be Replaced by Crowns.

Take for instance a lateral incisor three-sixteenth of an inch in diameter, as shown by Fig. 1, one-half that distance from the margin of the gum, drill directly through the tooth with a small size spear point drill, being careful that the drill comes out on the lingual surface of the tooth at the same distance from the gum as where it entered. Now take the next size larger drill and enlarge the hole already made, and so on until the tooth is entirely cut off.

Fig. 1.

The end of the root will be left perfectly smooth and ready for the crown.

This method does away with the disagreeable jar, noise and sliping which is always complained of by the patient where a bur or facer is used.

F. E. Buck, Jacksonville, Fla.

Board of Dental Examiners of the Territory of Arizona.

Tucson, July, 27th, 1893.

Dr. Theo. F. Chupein, Editor "Dental Office and Laboratory,"
Philadelphia, Pa.

Dear Doctor:—Enclosed find copy of the law regulating the practice of dentistry in this territory. The next regular meeting of the Board of Dental Examiners for examination of applicants for Practi-

tioner's Certificates will be held in this city, commencing Monday, Sept. 11th, 1893. Examinations will be both written and clinical, and not less than seventy-five per cent. will be required on each.

Yours respectfully, F. A. ODERMATT, Sec'y.

—

AN ACT TO REGULATE THE PRACTICE OF DENTISTRY IN ARIZONA.

Be it enacted by the Legislative Assembly of the Territory of Arizona:

SECTION 1. That it shall be unlawful for any person, who is not at the time of the passage of this Act, engaged in the practice of dentistry in this Terrritory, to commence such practice unless such person shall have received a licence from the Board of Examiners, as hereinafter provided for.

SEC. 2. The Governor of the Territory shall appoint, after the passage of this Act, five (5) skilled dentists of good repute, residing and doing business in the Territory, who shall constitute a Board of Registration in dentistry.

But no person shall be eligible to serve on said Board unless they have been regularly graduated from some reputable Dental College, duly authorized to grant degrees in dentistry, or shall have been actively engaged in the practice of dentistry for a period of ten (10) years previous to appointment.

SEC. 3. The length of terms for which the membere of said Board shall hold office shall be three (3) years, except that two of the members of the Board, first to be appointed under this Act, shall hold office for the term of one (1) year, two for the term of (2) years and one for the term of three (3) years respectively, and until their successors shall be duly appointed and qualified.

In case of a vacancy occurring in said Board, such vacancy shall be filled by the Governor in conformity with Section 2.

SEC. 4. Said Board shall choose one of its members President and one Secretary and Treasurer, and it shall meet at least once a year and oftener if it shall be deemed necessary.

Four of said board shall constitute a quorum. The proceedings of said Board shall at all reasonable times be open to public inspection.

SEC. 5. It shall be the duty of each person now engaged in the practice of dentistry in this Territory, to within ninety (90) days after the passage of this Act, to send an affidavit to the Secretary of said Board, setting forth his or her name, place of business, post office address, the length of time they have been engaged in the practice of dentistry in this Territory; if a graduate of a dental college, state the name of college, and shall pay to the Treasurer of said

Board the sum of Five dollars ($5) for which they shall receive from said Board a practitioner's certificate.

On failure to comply with the provisions of this section they shall be required to appear before the Board and be examined by said Board.

Sec. 6 It shall be the duty of all persons not holding diplomas, who wish to engage in the practice of dentistry in this Territory, after the passage of this Act, to appear before said Board at a regular meeting and pay into the Treasurer of said board the fee of Twenty-five dollars ($25) not returnable, and stand an examination by said Board in operative and prosthetic dentistry, and all the branches taught in a reputable dental college, and if such applicants pass an examination satisfactory to said Board, said Board shall issue to said applicant a license which will entitle him or her to practice dentistry in this Territory.

Sec. 7. It shall be the duties of all persons holding diplomas, who wish to engage in the practice of dentistry, after the passage of this Act to present or send to the Secretary at the regular meeting of said Board an affidavit and diploma with fee ($5) not returnable, and after said Board, being satisfied that said diploma belongs to said applicant and that it was issued in good faith by a reputable dental college, said Board shall issue to said applicant a certificate of registration for said diploma.

Sec. 8. All persons receiving a certificate to practice under this Act shall register his or her certificate with the County Recorder of the county in which he or she resides, and shall pay to the County Recorder for such registration, the sum of Two dollars ($2).

Any failure on the part of any person holding such certificate to comply with the first part of this section within thirty (30) days after receiving certificate, shall forfeit said certificate, and any certificate once forfeited, shall not be returned by said Board until applicant shall have paid to said Board the fine of Twenty-five dollars ($25).

It shall be the duty of each County Recorder, to forward to the Secretary of said Board the names of all persons having registered their certificates with them.

Sec. 9. It shall be the duty of said Board to cause to be kept a record of all its proceedings, and the names and addresses of all persons qualifying under this Act.

An annual report of the same shall be rendered to the Governor.

All moneys received by the Secretary under this Act, shall be used

for the legitimate expenses of said Board, but in no case shall any money of the Territory be used for that purpose.

SEC 10. Any person or persons violating any provisions of this Act, shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one hundred dollars ($100) nor more than two hundred dollars ($200) or confined six months in the county jail or both, for each and every offense.

All fines recovered under this Act shall be paid into the common school fund of the county in which such conviction takes place.

SEC. 11. It shall be the duty of the Prosecuting Attorney of each County to prosecute such cases when brought to his knowledge.

SEC 12. That nothing in this Act shall be construed so as to interfere with the rights and privileges of resident physicians and surgeons in the discharge of their professional duties.

SEC. 13. This Act shall take effect immediately after its passage.

Approved April 3, 1893.

CORRECTION.

In our last issue, on page 150, we gave the formula for a local anæsthetic to be used hypodermically, gleaned from one of our exchanges (*The Dental Register*) in an article by Dr. N. S Hoff, wherein *one drachm of distilled water* to be used with other ingredients. Our attention has been called to the evident incorrectness of the amount of water used with the other drugs, whereby the amount of cocaine would be so great as might lead to serious results, if used hypodermically, by Dr. E. C. McSherry, of Frederick, Md. The amount of water doubtlessly was intended to be *one ounce* instead of one drachm. We copied the formula from one of our exchanges, but did not note the discrepancy. We are obliged to the doctor for calling our attention to a matter of such moment, and we hasten to make the correction in this issue.—ED

CROWN AND BRIDGE WORK.

BY J. MARION EDMUNDS.

Crown and bridge work has long been a subject, not only interesting to the leaders of our profession, but has excited the attention, time and again, of the entire dental world. There have been hundreds of ingenious and practical devices in the construction of artificial crowns, as well as in the more advanced method of constructing and inserting artificial teeth, without plates—the so-called bridge work. With these ingenious and improved ideas there has also kept pace

corresponding development of manipulative skill, improvements in mechanical devices, and comprehensive and effective therapeutical agents. The recent consideration of our advanced thinkers are now bringing within the range of possibilities the practical application of this most valuable method of replacement. The cases suitable for the inserting of artificial crowns and bridge teeth, must be selected with caution and scientific skill. There are many roots that cannot be utilized as a means of support. The operation, therefore, is only of value where the root can be crowned, made perfectly inoffensive, comfortable, serviceable and durable to the patient. A pulpless root that is greatly denuded by absorption of the surrounding alveolus, much softened or very loose from extended destructive inflammation of the investing membranes, cannot be considered adequate to meet these requirements. This condition on the one hand, while on the other is that connected with impaired crowns, only partially broken down, with the pulp intact, the investing membrane free from disease, the cervical portion of alveolus and cementum unimpaired by decay, and firmly attached to the socket. Between these two extremes are gradations of normal and abnormal stages which may be operated upon, but the ultimate success of the operation will be more or less impaired, according to the condition of the root, and surrounding parts at the time of operating.

Therefore all prognostications should be based on a careful examination of the roots and surrounding parts. Any deviation from this method, excluding a recognition of these facts is delusive and unreliable. The results will not only be governed by the immediate condition of the root, but also by the general normal condition of the mouth. Any abnormal state of the hard or soft tissues, either by the presence of tartar, or any foreign deposit, will act as a predisposing cause in the development of unfavorable conditions. Whenever a root that has previously been treated for a chronic abscess, is selected to be operated upon, it is conservative treatment to open the pulp canal, completely fill it with cotton, the first piece having been saturated with a solution of chloride of zinc. This plugging of cotton should remain four or five days before crowning the root. If there is any inflammation of the gums around the teeth remaining, or if any are carious, appropriate treatment should be at once directed to them. Where a root or tooth has been restored to a normal condition, or where an inflammatory diathesis exists, the greatest caution should be used to avoid all unnecessary irritation. Irritation may be excited by files, saws, tapping of the mallet, slipping of corundum disks, the

use of excising forceps, scalers, trimmers, and most surely by cutting the root below the margin of the gum. If loosening or tenderness of the root should take place before setting the crown, it is best to defer the operation until all irritation or inflammation has subsided.

Suppuration is liable to follow irritation, then the removal of the crown becomes necessary, followed by a course of treatment and much annoyance to the patient, frequently involving the loss of the patient, through lack of confidence in both the operation and operator. The success of an operation may be greatly impaired by hurried, awkward, careless or injudicious manipulation.

Thus in cases where the remaining portion of a crown is improperly dressed with either a corundum disk, or any other instruments; or where the portion of a crown is left projecting, and the cap is made to fit it, in its ill shape. It will then project over and encroach upon the festoon of the gum, becoming a prime factor in setting up a dangerous inflammation. If in this case the crown had been properly dressed, slightly conical in shape, from the neck of the tooth to the articulating surface, and a closely fitting cap made to fit accurately around the neck of the tooth, the result would be perfect. While in the former case the result would be a miserable failure; and the opponents of crown and bridge work would quote this as valuable evidence of the worthlessness of the process, instead of awkwardness and ignorance.

Another important point to be considered is occlusion. If a crown is improperly set, there will be an injurious strain upon it. This may be by laterial pressure or direct antagonism, sometimes both, resulting in destructive inflammation, great distress to the patient, and the ultimate loss of the tooth.

Patients are not competent to judge either of the occlusion or adaptability of a crown in any case. It is therefore the duty of the operator to note the proper articulation of the teeth, and bear in mind the same for future reference. A patient's account of the condition is never to be relied upon; careful inspection only is to be depended upon. I have frequently had patients tell me a crown was "perfectly lovely" and "felt very comfortable," when it was an eighth of an inch too long, and the teeth on the opposite side would not articulate by half an inch. If a living pulp remains in the root, the best and surest mode of operating is to cut, with a small corundum disk, a niche on the labial and palital surfaces, near the margin of the gum. Then at once nip the crown or portion of crown off, with the excising forceps. The operation of nipping the crown in this way is generally painless: when pain is felt, it is very slight.

The next important step is the removal of the pulp, which is easily accomplished without pain if care is taken. My method by which I have removed over two hundred living pulps is as follows:—I apply to the wounded pulp a solution of chloroform and cocaine, five grains of hydro-chlorate of cocaine, to one dram of chloroform.

This solution must be applied directly to the bleeding pulp and renewed as often as necessary until the pulp is insensible to the point of the hypodermic needle. The needle may then be inserted into the pulp canal and three minims of ten per cent. solution of hydro-chlorate of cocaine injected. From three to five minutes should be allowed for the action of the cocaine before extirpating the pulp. As soon as the bleeding has ceased, the canal may be enlarged and sealed with liquid gutta-perchs and a few fibers of cotton. There are many methods of devitalizing a tooth or root. One of the most common is the application of arsenic. This should never be used, as it not only destroys the pulp, but the pericementum and all other vital connections of the root.

Another and more strictly barbarous method, is to *drive* with *one* blow, into the canal, a piece of orange wood which has been previously shaped and dipped in creosote or carbolic acid. I would, however, advise all those who are not in constant physical training never to perform this operation on a *male* patient, who is in size and strength their superior. After the root has been prepared, the apical foramen sealed, the canal enlarged to receive the dowel pin, and the crown selected, the next important step is fitting the crown. The method I consider best is original with me, based on considerable experience and very carefully tested.

I have taken pleasure on different occasions to show several members of this Society some interesting cases, and shall try in the future as opportunities may present to continue to do so. The cervical portion of the root must be at least one sixteenth of an inch above the free margin of the gum to permit of proper shaping. The labial surface must first be ground to a bevel or semi-wedge shape, from the pulp canal to the margin of the gum.

The dowel pin is then inserted and the crown or facing, ground to fit the ground surface of the root. The facing must then be backed with platinum foil and fastened to the dowel pin with hard wax. The formula is—(white wax 8 oz., gum dammar 4 oz., resin 1 dram., melt the wax, then add the dammar, stir occasionally until all the dammar is dissolved, then add the resin.) A half ferule of 22 K. plate is then made to fit the palatal surface of the root closely. This may also be

attached with hard wax to the dowel pin. The entire structure can now be removed and is ready to imbed, in plaster of paris and marble dust, pulverized pumice stone, sand or asbestos, one part of plaster to two of either of the latter ingredients. There should be no sharp corners, or square edges on the half ferule; they must be removed forming a neat curve from the centre of the summit on the palatal surface, to the base at the point of union, on either side, with the porcelain face. The square edges must be beveled very thin, and then burnished that no point of irritation remains. Neither must the ferule be inserted far beneath the free margin of the gum, or destructive inflammation of the periosteum will certainly ensue. It is necessary to try the crown, after it is finished, several times, pressing it well up to its place, noting every change in the color of the tissue, and removing any encroaching materials with the file; then again polishing and burnishing it before inserting. It is always best to have the ferule extend as little as possible under the gum, and the part that does so extend should be thin and fit very closely to the root.

Before leaving this part of my subject let me urge all those desiring to gain a reputation, not to adopt any of the cheap methods that are constantly advertised in the Dental Journals.

First, because a crown that has been properly selected in size and color, to correspond with the natural teeth on either side accurately, adapted to the absolute exclusion of all alimentary substances, is an invaluable operation to both patient and operator, and cannot be accomplished without skillful manipulation, the best and most desirable material, which all cheap articles tend to destroy.

Secondly, because cheaply constructed crowns that are made to fit by chance, take away from the operator his individuality and originality, therefore menace his manipulative ability and render him dependent upon the manufacturer, and unfit when called upon to give the peculiar manipulative skill requisite of the practical and progressive dentist.

Bridge work is the substitution of artificial crowns for carious roots or teeth which have been extracted, a process by which the intervening spaces are filled in with a number of artificial crowns joined together, and permanently fixed in the mouth by attachment to one or more of the natural teeth or roots.

Among the dental profession there is a great diversity of opinion in regard to the advisability of fixing such appliances permanently in the mouth. Some claim that it is uncleanly, contending that it is impossible to remove the constant accumulating oral debris, which

must not only become offensive, but a source of injury to the remaining teeth, resulting perhaps in their ultimate destruction by fermentation, putrefaction, decomposition and irritation. On the other side there are equally intelligent, competent, conscientious, and inexperienced dentists, who by long years of observation are thoroughly qualified and thereby entitled to their opinions. They meet these objections with positive denial of their existence, and commend in unqualified terms its excellence and superiority over all other methods of replacement when skillfully done under conditions favoring its insertion.

Among the admirers of this beautiful process I take the liberty to mention Prof. Joseph Richardson, M. D., D.D.S.; Dr. Brophy, Dean of Chicago Dental College; Bing of Paris, France; Drs. Evans, Low, Starr, Dwinelle, Dexter, and Kingsley, of this city, and many others.

The first account of bridge work is found in a report in the *Dental Cosmos* for Oct., 1869. This article stated that Dr. B. J. Bing, of Paris, has inserted a number of crowns in this manner, which had at that time been in the mouth nearly one year. Dr. Bing's method was to back a porcelain facing with 18 K. gold plate, soldering to the tooth to be inserted gold wire, either end resting in a cavity caused by decay or artifically formed for the purpose, the ends of which he builds into the cavities with gold foil.

The first record we have of bridge work in this country, is an operation by the late Marshall H. Webb, on Feb. 12th, 1873. This was a great improvement over Dr. Bing's method. This consisted of a porcelain facing backed with 18 K. gold, a part of which projected on either side. To these projections he soldered gold wire, something in the form of the letter U. The pulps of the adjoining teeth were extirpated and these projecting wires inserted into the pulp canal. Then a small piece of gold plate, about the size of the neck of the root extracted, was made to fit the gum, then soldered with a mass of solder forming the palatal surface of the crown.

In the year 1886, thirteen years later, this crown was as firm as when inserted. Bridge work proper is only comprehensive manipulative skill, of a higher order, applied to the fundamental principles advanced by Drs. Bing and Webb,—improved upon, step by step, as those in the grand march of the dental profession recognized the importance of their calling, to supply the vast demand for more modern improvements, and conservative practice in the dental profession than had heretofore existed. Hundreds of the brightest minds that had previously been in a semi-torpid state responded to the call of

advancement, each finding room in the vastness of the new field that was now opened for a multiplicity of ingenious devices in the construction and modes of attachment of artifical teeth to the remaining roots or teeth—thereby saving thousands of *useful teeth* that had previously been sacrificed to the forceps.

Bridge work is of two kinds, movable and immovable. Both have excellent points, the movable to my mind having somewhat the advantage in point of cleanliness, although there is no good reason why, if due care is observed, that the permanently fixed work cannot be kept as clean as the natural teeth. We all know by experience that the mouth is the most unclean part of the body even with those who pretend to take proper care of the teeth, and as to those who neglect this duty the condition is simply one of disgust and filth. And I think those who have practiced much in the Infirmary will agree with me, that language too strong can scarcely be used. Knowing this to be true, after the operator has put a mouth in fair order and charged his patient as to their responsibility in keeping the mouth clean, to my mind he is in no way further responsible to the patient for any trouble that may be caused by negligence and uncleanliness. For if a patient is by nature neglectful and unclean about the mouth, the only one thing that will aid in reforming them is frequent pressure on the pocket book, and with each assessment a gentle reminder of the cause.

I will now try to describe my method of construction; a movable case of bridge work, the principles of which are entirely original with me. My first case was constructed in Sept., 1885.

The preparation of the teeth is most important. It is so in all crown and bridge work, particularly so in movable bridge work.

Special care must be taken that the tooth or root is slightly conical in shape from the neck to the grinding surface. Enough of the grinding surface is removed to permit the insertion of two caps. After the tooth has been shaped a strip of copper thirty-four U. S. standing gauge, a little wider than the tooth may be placed around the prepared tooth which may be tightly drawn into place with a pair of flat nose pliers. The copper is now removed and trimmed to the marks indicated by the plyers, which will give the requisite size of the gold plate to make the ferule or band. The next step is to force the ferule over the tooth, pressing and burnishing as necessary to properly adapt the ferule to the form of the tooth.

When the ferule has reached the gum the encroachment of its square edges will be indicated by a change of color in the tissue from

pink to white. Now mark the ferule with an excavator around the festoon of the gum. The ferule must now be removed and trimmed to where it is marked. The edges should be filed and burnished before replacing it. This process must be continued until every part of the tooth is neatly covered, and slightly extending under the free margin of the gum. The edges must be beveled and burnished so there are no rough irritating points or edges remaining.

A neat impression may be taken by placing a small piece of wax on the grinding surface, pressing it firmly into place and allowing it to remain until cool. Then with a scaler or other suitable instrument remove the ferule and wax together. Run the ferule full of plaster and marble dust, cover it completely, except the wax, which can be removed as soon as the plaster is set.

After the wax is removed, make a peper pattern, by pressing a piece of paper over the imbeded ferule, cntting it out as indicated by the impressed line. A piece of platinum foil is cut to this pattern and pressed into the open end of the ferule, which may have sufficient 18 K. gold solder flown over it to make a cap.

This completed, the cap is ready to be finished and cemented to the prepared tooth. Another cap is now to be made to telescope over the one in position. The ferule first being made, not quite extending to the gum. It must project at least one thirty-second of an inch above the surface, The wax may be used as I have previously directed, differing only in having the patient close their teeth upon the wax, thus securing an impression of the antagonizing molars or bicuspids. From this impression run a plaster model which can be duplicated in sand, and cast in zinc, making a die to strike up the cusps, for the movable or outside ferule. I find many advantages in making cusps in this way, from very thin 22 K. gold plate. After swaging the cusps and trimming them to fit the ferule, 20 K. solder may be flown in the depression of the under side, making them solid. The cusps are then to be soldered to the ferule, making a beautiful cap. One of the greatest advantages of this method of making cusps is that an operator can secure more perfect occlusion of the teeth than can be obtained in any other way. Because if the cusps are made from an impression of an antagonizing tooth, they are a fac-simile of the natural organs, and will perfectly articulate with the same. The details of this operation must be followed out with other teeth selected for attachment.

Supposing that two teeth, a right superior third molar, and a right superior first bicuspid, were capped and crowns made to telescope as

above described, the coowns should be then placed over the caps, care being taken that proper occlusion had been obtained, an impression should be taken in the following manner :—Mix the plaster to about the consistency of putty, pack this well around the crown and fill the spaces between them well. Now have the patient close the mouth, observing that the proper articulation has been secured. By these means the bite and impression is taken at the same time. After the plaster has set, request the patient to open the mouth, which will generally break the impression. This is most always done. The pieces are then laid carefully aside until dry, when they may be put together with silex or wax, at the option of the operator. The impression should now be varnished with shellac varnish, the formula is—(gum shellac 3 oz., alcohol 1 pint.) This makes a thick varnish, which is well adapted to this work. As the impression is now put together with the gold crowns imbedded in it and varnished, the next step is to place it in the articulator, mixing the plaster medium and filling both sides at once, which makes an excellent model to work on. Next grind and fit the selected crowns to the model. Also grind the cusps off, leaving a flat surface, and back them with platinum foil, allowing the foil to extend over the flat surface of the crown about one-eighth of an inch. Now wax these to the gold crowns with hard wax, and place the gold cusps, made in the manner described, in proper positiou, over the porcelain facings, in such a manner as to secure perfect occlusion between the golds cusps and the cusps of the natural teeth. This being completed, the piece may be removed from the articulator, and imbedded in a matrix, made by mixing one part of plaster to two parts of marble dust. Then as soon as this sets, the wax can be removed and the matrix filled with 20 K. solder and covered with a piece of charcoal, that it may cool slowly.

After it is cooled it is ready for finishing and insertion. The advantages of this method will be readily appreciated by those who take into consideration the cleanliness and accessibility of the piece in case of accident when repair is needed. I have one more original device to describe in connection with movable bridge work. I think this case is the largest on record.

Eight months ago, a lady consulted me regarding her mouth, which was in a bad condition of ulceration, caused by a poorly constructed rubber plate, which was neither useful nor ornamental.

There were only two superior third molars remaining in the arch; these were loose and the alveolus was in a state of suppuration. After due consideration I decided to try and save the teeth, and by my method replace the entire denture. After two weeks treatment I

prepared the two teeth and capped them, after which I made gold crowns to telescope over the caps; I made a die and counterdie, swaged a rim 22 K. gold plate, 28 U. S. gauge in thickness by $\frac{3}{8}$ of an inch in width to fit the arch. Placing this in the mouth and telescoping the crowns in their places, I secured a second impression and bite, which was placed in the articulator. After trimming and varnishing, the impression was removed by piece-meal, and countersunk teeth, waxed to the rim and crowns. These I removed from the articulator, placed in a flask and vulcanized in the usual manner, using pink rubber to attach the teeth to the gold rims and crowns. I have since that time treated the remaining two teeth, and I am happy to say with success, as they are becoming more firmly attached to their sockets. They are perfectly comfortable to the patient, suppuration having long since ceased, notwithstanding the strain of an entire denture upon them.—*N. Y. Dental College Record.*

BOOK NOTICES.

PAMPHLETS RECEIVED.

General announcement of the Philadelphia Dental College and Hospital of Surgery.

Forty-eighth annual announcement of the Ohio College of Dental Surgery.

Announcement of the Rochester Post Graduate Dental College.

University of Minnesota—Special announcement of the College of Dentistry.

Annual announcement of the Atlanta Dental College of Atlanta, Georgia.

Fifty-fourth annual Catalogue of the Baltimore College of Dental Surgery.

THE PRACTICAL PLACE.

German Silver.

This alloy is now used to a considerable extent in dentistry, especially for regulating appliances. It is strong, tough, flexible and admirably suited for this purpose. It may be soldered either with silver solder when used for these appliances, or with 14 or 18 karat gold solder if designed to be used with vulcanite. It may be boiled in the pickle (one part of sulphuric acid to three parts of water) used to dissolve the borax which is employed as a flux for these solders,

and it can be vulcanized next to rubber perfectly. There seems to be no deliterious influence to the organism when left exposed to the fluids of the mouth, either as regulating appliances, or when used, in cases of close bite, to back a tooth for a vulcanite case, with an extension or lug embedded in the rubber. In the latter case it must, however, be soldered with gold solder.

The formula for this alloy is nickel, copper and zinc in different proportions, 40 parts of nickel, 60 of zinc and 100 of copper. It is a misnomer since no silver whatever enters into its composition. The alloy derives its name from the fact of its having been first produced in Germany. In Knight's English Cyclopedia we find that the alloy was obtained by smelting an ore found at Hilburghausen, near Suhl, in Hennberg.

While the name German Silver has clung to it, Knight says: "An Alloy, however, very similar in appearance and properties, has long been known to the Chinese, under the name of *pakfong*, or white metal."

It has all the appearance of silver and is susceptible to a high polish

It is admirably adopted for the prompt construction of matrices for filling teeth, as well as being a great save, or economy of gold, in the use which may be made of it for strengthening upper or lower vulcanite plates by using it in the form of wire, embedded in the vulcanite, for this purpose.

Ancient Superstition About the Cross and the Teeth.

Ricordus, a historian of the thirteenth century, quaintly writes, saying: "The loss of this cross was a great one to humanity. The mouths of our ancestors used to be supplied with thirty, or, in some instances—no doubt according to their faith—thirty-two teeth; but that since the cross was stolen by the infidels, no mortal has been allowed more than twenty-three."

How to Drill Glass.

Tell your correspondents if they wish to "drill glass," and do it successfully, to make a drill of the required size out of a bit of Stubs steel wire. Make the cutting edge just like a stone drill, having the corners square and sharp. Heat the drill with the blowpipe to a white heat and drop it instantly into water. A few trials will get it hard enough. Rotate the drill in a small drill stock, keeping the cutting edge wet with a solution of camphor in turpentine. Sharpen the drill occasionally on an oil stone. Such a drill will cut a hole

through plate glass three-eighths inch thick in about one minute. If the glass is thin, paste writing paper on each side with common mucilage.

A little practice is necessary with this as with everything else Having tried about every way mentioned in the books, I can say that this is the only way ever tried which did not end by breaking the glass. C. W. N.'s three-cornered file always broke my Holtz plates. —John W. Kales, M. D., in *Scientific American.*

How to Cure a Cold.

Almost everybody has a remedy for a cold, which he is ever ready to recommend to others after detailing his own experience. The Boston *Journal of Commerce* quotes from a medical writer some advice on this subject which seems to be more than ordinarily useful.

When one becomes chilled, or takes cold, the mouths of myriads of little sweat glands are suddenly closed, and the impurities which should pass off through the skin are forced back at the interior of the body, vitiating the blood and putting extra work on the lungs and other internal organs. Just beneath the surface of the skin, all over the body, there is a network of minute blood vessels, finer than the finest lace. When one is chilled, the blood is forced from these capillary vessels into one or more of the internal organs, producing inflammation or congestion, and thus often causing diseases dangerous to life. The time to treat a cold is at the earliest possible moment after you have taken it. And your prime object should be to restore the perspiration and the capillary circulation. As soon, then, as you feel that you have taken cold have a good fire in your bedroom. Put your feet into hot water as hot as can be borne, and containing a tablespoonful of mustard. Have it in a vessel so deep that the water will come up well toward the knees. Throw a blanket over the whole to prevent rapid evaporation and cooling. In from ten to five minutes take the feet out, wipe them dry, and get into a bed on which there are two extra blankets. Just before or after getting into bed drink a large glass of lemonade as hot as possible, or a glass of hot water containing a teaspoonful of cream of tartar, with a little sugar if desired. Should there be a pain in the chest, side or back, indicating pleurisy or pneumonia, dip a small towel in cold water and wring it as dry as possible. Fold the towel so that it will cover a little more surface than is affected by the pain. Cover this with a piece of flannel, and both with oiled silk, or better, with oiled linen; now wind a strip of flannel a foot wide several times around

the chest. The heat of the body will warm the towel almost immediately. the oiled linen and flannel will retain the heat and moisture, and, steaming the part, will generally cause the pain to disappear. Should there be pain or soreness in the throat, you should treat in a similar manner with wet compress and flannel bandage. Eat sparingly of plain, simple food. Baked apples and other fruit, bread and butter, bread and milk, milk toast, baked potatoes or raw oysters may be eaten. By following the above directions intelligently and faithfully you will ordinarily check the progress of the cold, and prevent serious, possibly fatal, illness.

History of the Thermometer.

The invention of the thermometer marks an epoch in science, for it alone has permitted of obtaining a knowledge of the laws that govern calorific phenomena. The first idea of it is perhaps due to the celebrated Van Helmont, who devised an apparatus which, to use his words, was "to prove that the water contained in a bulb attached to a hollow rod rises or descends according to the temperature of the surrounding medium."

In the seventeenth century, the necessity of an apparatus adapted for measuring the difference of the temperature was so greatly felt that Galileo, Bacon, Scarpi, Fludd, Borelli, and other scientists of the epoch devoted themselves in this direction to researches that were not always crowned with success. It is not till 1621 that we find a beginning of the solution in the experiments of a Dutchman, Cornelius Van Drebbel. This physicist's thermometer consisted of a tube filled with air, closed at its upper extremity and dipping at its other extremity (which was open) in a bottle containing nitric acid diluted with water. According as the external temperature rose or fell, the air in the tube increased or diminished in volume, and consequently the liquid descended or rose.

This instrument. called the *calendare vitrum* (indicating glass) by its inventor, constituted what has since been called an air thermometer. but as its gradation was based upon no definite principal, it was incapable of furnishing any comparable reading.

Along about 1650 the members of the Academia del Cimento, at Florence, introduced into the thermometer certain improvements that gave it nearly the form that it has to-day ; and its principal was based upon the expansion of liquids. The tube was filled with colored alcohol. In order to graduate it, it was taken to a cellar and the place was marked where the liquid came to a rest. Then, starting

from this, the portions situated above and below the mark were divided into one hundred equal parts. As may be seen, it was impossible with such a system to construct two instruments that should agree. Nevertheless, it was the only apparatus that was made use of for half a century.

Finally, in the latter part of the seventeenth century, the physicist Renaldini, of Pisa, a professor of Padua, proposed that all thermometers should take the freezing degree of water as a fixed point, and, as a second fixed point, that to which alcohol rises in a tube dipping in melted butter, the intervening space to be divided into equal parts.

From this epoch, then, dates the present thermometer, and the first instrument due to this innovation dates back to 1701. This was constructed by Newton, and was the first thermometer given comparable readings that had been devised. The liquid that he adopted was linseed oil, which is capable of supporting a higher temperature than alcohol without boiling, and his fixed point of graduation for the upper limit was the heat of the human body, and for the lower, the point at which the oil stops at the moment of its congelation.

A search soon began to be made for a thermometric agent other than oil (which was too feebly expanded by heat and which congeals at but a slightly elevated temperature), and, in 1714, Gabriel Fahrenheit, of Dantzig, almost completely solved the problem in the construction of the thermometer that now bears his name. This was immediately adopted in Germany and England (where it is still employed) and was introduced into France. But along about 1730, scientists gave preference to the one that Reaumur had just devised.

Finally, in 1741, Celsius, a professor at Upsal, constructed the instrument called the centigrade thermometer.

The three last-named instruments are the most commonly used. and differ only in the graduation of each.—*La Science en Famille.*

New Process of Nickel Plating.

MM. Mond, Lang and Quincke have recently shown that when carbonic oxide is passed over pure nickel maintained at 30° C. (86° F.), the two substances unite, forming a gaseous substance, which may be condensed into a liquid, boiling at 43° (109.4° F.). This liquid is exceedingly volatile, and dissolves readily in coal oil or benzine. It is decomposed, either in the gaseous or liquid state, or in state of solution, by a very slight rise of temperature, giving off carbonic oxide and depositing a very hard, brilliant, and white film of

nickel. In order to make practical use of this fact all that is necessary is to immerse the object to be plated in the liquid, the solution, or even in the gas, and slightly raise the temperature beyond 110° F. Deposition is made at once. Plaster casts, paper, or any other substance may be plated by first giving them a conducting surface by rubbing with graphite. The nickel should be as near pure as possible, that resulting from the decomposition of the oxide by hydrogen being the best.

Liquid Dentifrice.

P. C. P., Danville, Va.—The essential ingredieut in a liquid dentifrice when intended as in most cases to act as a cleanser, and not as a perfume only, is soap. A serviceable preparation may be made by the following recipe .

Castile soap (white)	½ oz
Oil of peppermint	5 drops
Oil of wintergreen	12 drops
Glycerin	½ oz
Water	1 oz
Alcohol	2 ozs
Cochineal tincture	sufficient to color

Quillaia is sometimes used in similar mixtures instead of soap ; but the soap is preferable, as quillaia is a very irritating substance, and its active principles, saponin, is credited with being a decided poison.

Wintergreen which is the leading flavor in the foregoing mixture seems to be popular for the purpose, and peppermint is very efficient in "sweetening" the breath ; but of course other aromatics may be used in their stead. A very fine combinatian is found in the celebrated Eau de Botot, an imitation of which is made as follows :

Oil of peppermint	30 mins
Oil of spearmint	15 mins
Oil of clove	5 mins
Oil of red cedar wood	60 mins
Tincture of myrrh	1 oz
Alcohol	1 pt
Compound cochineal tincture, sufficient to color	

As here given, this preparation is intended to use as a perfuming wash after applying soap, etc., but of course soap may be dissolved in the proportion indicated above, if it is desired have it act as a detergent.

Care must be taken in making it, not to confound the oil of cedar

wood with the oil of cedar commonly sold ; the latter is from an entirely different source and smells like turpentine ; while the former has the odor peculiar to the wood so largely used in the manufacture of pencils.

New Method of Obtaining Oxygen.

Werner Langguth states (*Engineering and Mining Journal*), that an ample supply of pure oxygen may be obtained cheaply, from a solution of chlorinated lime. If a few drops of a cobalt salt (nitrate of cobalt, Co. $(NO_3)_2$, for instance) be added to a strong solution of chlorinated lime in water, and the liquid shaken well, an evolution of gas will be immediately observed, the production of which will be increased by a slight rise of temperature. The gas thus produced is pure oxygen, free from chlorine, and may be dried, if required, in the usual manner. The evolution is not violent, it is said, and the reaction gives an even and continuous flow of oxygen for a long time ; that is, until all the chlorinated lime in solution is converted into calcium chloride : $CaCl_2+Ca\,(ClO)_2+H_2O=2O+2CaCl_2+H_2O$. The few drops of nitrate of cobalt added are precipitated as cobalt hydrate, which suffers no further change, producing by its presence only the liberation of the oxygen ; a fine illustration of catalytic action. It is needless to say that the precipitated hydrate can be used over again and again, with the same effect. The calcium chloride solution is decanted from the settled cobalt hydrate in the generator, which is recharged with a fresh solution of the chlorinated lime and shaken, and the evolution of oxygen commences again. Nickel salts will act on the lime combination in the same manner, but the evolution of oxygen is much slower.

Concerning Memory.

History furnishes us with a large number of examples of wonderful memory.

Scaliger, an Italian, in twenty-one days committed to memory the Iliad, which comprises 15,210 verses, and the Odyssey, which also comprises a large number ; Lipsius, a professor at the University of Leyden, offered to recite Tacitus' history in its entirity in the presence of a person armed with a poignard, who should stab him with it at the first error ; Louis XIII., after a year's time, could draw from memory the plan of a country with all its details ; and the actor Lassaussiclere, after reading advertising sheets for an hour, could repeat them textually, and this, it may be said, by way of parenthesis,

must have been pretty wearisome. It is stated also that an Englishman who had an extraordinary memory was introduced to Frederick at Potsdam, and on the same day Voltaire having brought some verses to the king, the latter had the Englishman concealed and requested Voltaire to read his work. "But these verses are not yours," said the king, "they were recited to me this morning." He then produced the Englishman, who, to the great astonishment of Voltaire, recited them without error.

It is especially in the legendary stories of antiquity that we find numerous examples of extraordinary memory. Let us recall the fact that to Adrian the successor of Trajan, to Mithridates, to Themistocles, to Scipio, to Cyrus, and to many others, is attributed the faculty of remembering the names of all their soldiers; that it is claimed that Hortensius the orator attended a public sale lasting a whole day and recalled, in order, all the objects sold and the names of the purchasers; and that the ambassador Cineas, having been received in the senate, saluted by name, on the following day, all the senators, whom he had seen but once. These numerous examples from antiquity are easily explained. In fact, before the dissemination of the art of writing, the development of the memory was indispensable. In our day, this faculty is less cultivated, at least for ordinary requirements, since, by means of notes, we can almost dispense with it. Yet there is a memory that every one possesses and that many persons are ignorant of, and that is the memory of the eye, the memory of things seen, that of the artist and the draughtsman—the faculty that permits the latter to reproduce an ornament, for example, that they have seen but once. This memory is possessed by every one in a greater or less state of development, for every one sees, and to a greater or less extent classifies in his brain the things seen, and that too without being conscious of it. It is this memory of the eye that forms an excellent mnemotechnical method.

The following are a few examples. Many soldiers, in order to recall theory, endeavor to figure to themselves the page *recto verso* and then the place on the page where the article that they wish to recall is found. Certain prestidigitators employ the same method for indicating in a book the page and line containing a citation that is made to them. Others, after having had repeated to them any forty common names, at once repeat them in order, either by commencing at the beginning or the end, or at random, in assigning to each of them the number of the order in which it has been given. An author of the 16th century named Muret tells that he once saw a Corsican to whom he dictated two thousand Latin, Greek, and barbarous words having

no affinity with each other, and who repeated them to him in order. This appears to us doubtful, for it is pretty difficult to memorize and repeat forty words only, and requires a well drilled memory. Yet with the memory of the eye we can quickly reach the same result, not with forty, but with twenty names, for the difficulty increases in proportion to the number of words added. It is necessary to proceed as follows : Let us suppose that the first name given is "mouse ;" do not attempt to recall the word, but cousider your memory as a sensitized photograph plate—in a word, make a negative of the object, see before your eyes the animal itself walking slowly and carrying a placard marked No. 1. Let us take "hat" for the second name. Imagine a hat with the number 2 fixed above, as upon the hat of a conscript. For number 3 let us suppose "chair." Imagine a chair provided with a number showing its price as marked by the dealer, etc. You will then easily recall the succession of the objects and the number of their order and will be able to name them in every way possible. Proceed in this manner up to ten, and then the next day up to twelve, and so on, gradually iecreasing the number. After a few repetitions of this exercise, you will be astonished at the ease with which you will succeed in retaining twenty or more words, absolutely classified in your mind as if on drawing paper, so that when you are asked the number the name will come to your mind, and reciprocally. This is a pleasing diversion for family reunions on long winter evenings.—M. Alber, prestidigitator, in *La Nature.*

A Convenient Mixing Slab.

If the heel of the hand is used for a palet in mixing oxychloride or oxyphosphate, there will be no need of warming the glass or porcelain slab. Use slab merely to incorporate the fluid and powder, and then taking it up on the spatula, transfer to the hand and finish kneading, and carry to the cavity. The heat of the hand keeps it plastic for a longer time. For small quantity I use the hand only ; but a large quantity produces too much heat for comfort. After a little practice, my word for it, no one will bother about a warm slab.—J. R. Clayton, Shelbyville, Ind., *Items.*

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GENERAL INDEX FOR VOL. VII.

THE

Dental Office and Laboratory.

FOURTH SERIES.

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WHAT ARE THE BEST METHODS FOR OBTUNDING SENSIBILITY OF THE DENTINE BY EITHER LOCAL OR GENERAL MEANS? SHOULD ARSENIC EVER BE USED?

Paper read before the Pennsylvania Association of Dental Surgeons by WM. H. TRUEMAN, D.D.S., PHILADELPHIA, PA.

To fully answer this question a volume might profitably be written. indeed, were this audience students who were as yet at the threshold of dental science. justice could not be done to it in so brief an essay as the present occasion calls for. Recognizing, however, that the attempt is to simply promote and facilitate an orderly interchange of mutual experiences, I shall, as it were, merely catalogue the more prominent features, presuming while so doing that on this subject we are all, in theory and practice, equally well posted.

I take it, that by sensitive dentine, we understand an *abnormal* sensitiveness of this portion of tooth tissue. We recognize that while cutting into tooth tissue either normal or carious that there is to be expected an appreciable degree of discomfort or pain. indeed. in practice. the absence of sensation invariably suggests a doubt of the tooth's vitality. In a large majority of cases this discomfort is quite bearable, so slight, indeed. that we would hardly call it pain. We recognize. also that this discomfort may be greater or less as the cutting tool encroaches upon. or is remote form those portions of the tooth that normally are, as we term it, sensitive. It is only when this discomfort becomes excessive, when it unduly taxes the endurance of the patient that we speak of it as sensitive dentine. and seek for some means to obtund it. In its origin the cause of sensitive dentine may be systematic or local. This must be considered when seeking means to control it. So much, indeed, does the choice of means depend upon the cause that I cannot see how they can profitably be separately considered. In answering the question I shall take the liberty of substituting the word controling, in place of obtunding; the words are not in this connection synonyms; controling has a

broader meaning, and its use permits a more practical discussion of the subject The desired object in many cases is best attained and the sensitiveness controlled by managing the patient, rather than by applications to the sensitive portions of the tooth.

We will first consider systematic causes and systematic treatment, not, perhaps, in that order a careful study of the subject would suggest, but rather impromptu.

We recognize, first, that either from their physical make up, or the result of mal-education, some patients feel pain more acutely or bear it with less fortitude than do others. How to differentiate these two conditions and the best means of treatment must be learned from practical experience, it can be acquired in no other way.

In the last number of the *International Dental Journal*, (May, 1893), are two papers that I have read with unusual interest. One is by Dr. Hamilton Osgood, of Boston, Mass., upon The Use of Hypnotism in Medicine, the other by Dr. Thomas Fillebrown, also of Boston, upon The Use of Hypnotism in Dentistry Both are unsatisfactory in that not having been originally written for publication, but reported papers read at a dental gathering, a clear and explicited understanding of them cannot be had without the illustrative demonstration accompanying the reading, at least not by those so little acquainted with the subject that their imaginations fail to supply the deficiencies. I have always been impressed that hypnotism, mesmerism, animal magnetism, etc., were so closely allied to empiricism as to be unworthy of notice. If the claims made for it by these two gentlemen, both of whom are entitled to respectful consideration, should prove to be tenable, it may perhaps be useful in treating such cases as these. Indeed, it is a question whether or not we have been unwittingly using it. Just what the gentlemen mean by hypnotism, or how they bring the patient so completely under their control I cannot quite grasp. It seems, however, very like a recital of that which no doubt is to each one of us a daily experience. The restless patients we control at times by commands, by persuasion, or by assurance So far as I can gather this hypnotism is produced by assuring the patient that there will be no pain, that there is no pain, that it is not hurting, and thus by progressive assurance and constantly insisting, over rule the patients' will so completely, that they are not conscious of suffering, and are as it were asleep There is much in this; by judicious suggestion we can very often so quiet restless patients as to facilitate our work. I have never however, been able to control them to that extent claimed by Drs. Osgood and Fille-

brown My patients have an annoying habit of waking up too soon and at inconvenient times. When we remember how mysterious are the workings of the human mind, it is not best to hastily dismiss anything of this kind that promises to be of practical usefulness simply because it does not conform to our ideas of that which we are pleased to call "science." A few years ago I met a gentleman of education and intelligence who had been bedfast for months from rheumatism, scientific medicine having failed to give him relief. At the suggestion of a friend he sent to an advertising quack for a magnetic ring, a ring made of zinc, into which was inserted a few rivets of copper, and intended to be worn on the finger. A week after putting it on he was out, and in a few weeks more, free from pain or stiffness, was attending to his business a well man.

Another case A gentleman I well knew was bedfast and helpless, I think from a rheumatic affection, and had so been for some time with but little hope for recovery. One night while his attendant was absent the lamp (one using the old fashioned burning fluid in use some forty years ago, a mixture of alcohol and spirits of turpentine I think it was) exploded, setting fire to the room. His cries for help were not heard, the fire reached the bed, in his excitement he arose and worked so vigorously in extinguishing the fire that when help arrived the danger was over. The man who a few moments before was so helplessly ill did not return to bed, he dressed, and the next day was up and about superintending his business. During the excitement his disease left him and did not return; he lived in the enjoyment of good health some thirty years, dying of old age an octogenarian. And still another case: A dentist, a graduate of the old Philadelphia College in 1855 or 6, told me a few years ago that while suffering from a distressing malady that his medical attendant had failed to relieve, he was advised to carry in his pantaloon pocket of the afflicted side a round potato about the size of a walnut. Having but little faith in it, and feeling not a little ashamed of the weakness it indicated, he quietly pocketed the potato, and within a short time felt decidedly relieved, so much so that he at once stopped taking medicine and soon regained his usual health. The experience he had several times repeated on a recurrence of the trouble with a like satisfactory result.

And still another case: A maiden lady of means, refinement and education, aged about fifty, very deaf, so much so that she carried with her at all times a tablet and pencil which she handed to those with whom she desired to communicate with the request, "Will thee

kindly write, I cannot hear," while visiting a religious meeting at which the efficacy of prayer was being considered, she was strongly impressed. She arose, stated her affliction, and how seriously it impaired her usefulness in the charity work to which her life was devoted, and asked for the prayers of the audience that her hearing might be restored. Her remarks were so earnest, and so fully in accord with the feeling pervading the meeting that the request was at once acceded to. Before the meeting closed she announced that the prayers were answered, and amid much religious excitement declared that she could hear perfectly. I saw her a few months after. She grasped me warmly by the hand and with much feeling exclaimed: "Doctor, I shall not trouble thee again to write on the tablet, my hearing has been restored, I can hear perfectly," and then related her experience. I soon found, however, that this was a delusion. Although she declared that it was not at all necessary that I should raise my voice, she could hear a whisper, I found it utterly impossible to communicate with her without reducing to writing all I had to say. Before, I could by speaking very loud and distinct, and occasionally repeating, carry on a conversation after by writing our minds had been brought in accord, but now, while she answered questions and replied to remarks promptly, her answers and replies were not to what she really heard but to what she thought had been said, and were appropriate only by mere accident. The pencil and slate were more than ever necessary, yet strange to say, *that* she did not seem to appreciate, and while accepting the assistance acted as though I used them from force of habit only. Her relatives and associates tell me that they find increased difficulty in communicating with her from the fact, that she does not seem to appreciate her deafness. A year later, when last I saw her, she was still under the delusion. She is so much brighter, more cheerful, and seems in every way so happy in the delusion that her friends make no effort to combat it. In every other respect she is, mentally and physically, unchanged. Now, is this a phase of hypnotism? Could we make our patient's while otherwise unchanged, as oblivious to pain as she is to her deafness, what a boon it would be.

These are but types of cases that, well authenticated, can be duplicated indefinitely. We may laugh at these things but that neither refutes nor explains them. They are but illustrations of the thousand and one ways in which the thing we call mind controls the other thing we call matter. The patient who feels that liniments and doses scientifically prescribed and faithfully used were being used in vain,

have the best of us when they say, "I put on the ring and was soon well," "I pocketed the potato and felt like a new man." They wanted to be rid of their ailment, this accomplished, whether, it was a mere coincidence or a result, is to them a small matter. If hypnotism, or mesmerism, will enable us to work upon sensitive teeth with comfort to ourselves and our patients—that is the practical point—let us use it and study the science of it at our leisure. I am not as yet a convert, I confess, however, to being a little drawn towards the anxious bench. It is worth looking into.

With some women patients there are times, as we all recognize, when, to use a well understood expression, "their nerves are high strung," and dental operations are more than usually trying. This many of our patients have learned from experience, and I am frequently conscious that it is considered when making appointments. The remark, if it will make no difference, I would rather defer it a week or two, I will then be better able to bear it," usually refers to it. At other times the dressmaker is a convenient excuse for a prudent postponement. Among many valued suggestions of my preceptor was that, when the teeth of women patients seem more than usually sensitive, a postponement of painful operations will always be in order. A week or ten days delay has in a multitude of cases been of more practical value than any medication that could have been used.

A successful physician's arcanum, and a successful dentist's, also I take it, will ever be in placing "tact" before "physic." Dismissing now cases calling specially for tact, I will now ask your attention, briefly, there is in it but little that is new, cases calling for physic.

Active systemic treatment (dosing) to reduce hyper-sensitiveness of dentine should be cautiously approached. The use of sedatives, such as the bromides, has been suggested, and in a limited number of cases it has seemed to have value, but there is always a risk, and I have not thought that, except in unusual cases occuring at long intervals, a dentist is justified in their administration. Their general use would, undoubtedly, be productive of much mischief. No matter how thorough has been his education, how well posted, or how scientific a dentist may be, if he have the necessary practice to acquire and maintain a fair degree of skill as a dentist he has neither the time or opportunity to become skilled in the use of medicines. It is not book learning, it is not attending a medical course, but it is the practical knowledge which comes from every-day use of medicine, and constant observation of their effect under varied circumstances, that gives the experience, without which the administration of medi-

cine is an *unjustifiable tampering with a patient's health.* In my judgment a wise dentist in treating these cases will confine himself closely to local applications.

For present purposes we will consider local cases calling especially for local treatment to refer to those cases where the hyper-sensitiveness is localized, as for instance in cervical cavities, this distinction, be it understood, is merely for convenience. First in importance, and the most reliable and generally useful is dryness of the cavity, and next to this we may name heat; they are, however, closely associated. Since Prof. Thos. C. Stellwagen, of this city, many years ago suggested the glowing end of a charred match stem, a legion of new agents for, and new methods of applying heat have appeared. I question, however, if in any of them there is any virtue apart from the greater or less dryness resulting. So far as I have experimented I have not been impressed that the various methods have any practical advantage, the one over the other, apart from the greater or less convenience of their application. There is this that I have found, and I presume it is a common experience; that all new methods and remedies for obtunding sensitive dentine at first work like a charm, they are the very things we have long waited for, yet one after the other in a short time are laid aside Phosphoric acid, the essential oils, and a multitude of obtunding agents have had their day. Silver nitrate, so useful in rendering less sensitive exposed tooth tissue has with me proved of little value in preparing cavities. Zinc chlorid, holds its own, but I seldom use it on account of the acute pain attending its application. Robinson's remedy has proved, perhaps, as generally useful as anything that I have tried The application of cold, if so unscientific an expression may be permitted, has from time to time had its advocates. My experience with rhigolene and ether spray in 18 6 impressed me unfavorable I have seen nothing in later freezing methods to warrant a re-trial.

Now, in conclusion: Shall arsenic ever be used? An appropriate answer to this question may be found in Dr. Elisha Townsend's address before the American Association of Dental Surgeons, at the meeting in Baltimore, March, 1850, in which he recommends that the amalgam pledge adopted by that Society in 1845 be recinded. (See Dental News Letter, Vol. 4, page 65.) His objection that the amalgam pledge was "an embargo upon opinion," applies with equal force to any action intended to restrict individual judgment in the use of arsenic. Any dentist who is as well informed, as every dentist should be, regarding the immediate and ultimate action of arsenic so

used, is quite competent to decide whether the best interests of the patient will or will not be served by its use. During my professional life I have three times used it to obtund sensitive dentine, and would not hesitate to so do again should a case present where I thought it the best thing to do. One case has passed out of mind, the other two patients I have continuously waited upon, and have seen within a few weeks. Allow me to relate briefly their history.

In 1871, a lady aged about nineteen presented. She had been ill a long time, said to be from a spinal trouble. During the preceding few years all attempts to operate upon her teeth had failed. The teeth were excessively sensitive; the patient from continuous suffering was unable to bear the necessary manipulation, and imperfect work had been the result. The teeth had become more and more sensitive, and so aggravated the systemic conditions, that the point had been reached when something *must* be done. Her physician declared that until the dental irritation had been allayed he could do nothing, and in a message to me he said, she could not much longer bear her suffering, and that unless the teeth could speedily be made comfortable he advised their extraction, but doubted seriously if she could survive the shock. Desperate cases demand desperate remedies. Selecting two cavities that seemed to be giving rather more trouble than the others, although they were comparatively superficial, I applied arsenic, allowing it to remain about eight hours. Immediately upon its removal, the cavities, now but slightly sensitive, were excavated, the cutting being continued until sensitive tissue was encountered, and gold fillings were inserted. These fillings I saw last February, and after twenty-two years service they are still in good order. Of course both pulps died; that I expected when the application of arsenic was made. The treatment of the roots, however, was deferred until the patient's health had materially improved. The first to show signs of devitalization was opened into some nine months after; the other gave no evidence of loss of vitality until after the lapse of two years. After the dental irritation had been allayed the improvement in the general health was immediate and gratifying. The less serious cases were then taken in hand at long intervals; from the beginning of March to the end of November fourteen fillings were inserted, and the teeth then pronounced in good order, the general health being nearly restored. I am impressed that in her case the arsenical application was the turning point. She told me then, and has often repeated it, that the night after the fillings were inserted was the first restful night's sleep she had had for months.

The other case was treated during May, 1869 A Miss, aged about thirteen, in poor health from causes incident to her age and sex. Two superficial cavities upon the anterior approximal surfaces of the superior central incisors were very sensitive, and evidently aggravating the systemic conditions. After repeated failures to so obtund the sensitiveness that the cavities could be filled, arsenic was used as a last resort and with excellent effect. The application was allowed to remain over night, the cavities immediately excavated until sensitive tissue was reached and filled. These were closely watched. November, 1873, one was found to be devitalized and the root treated. The filling in that tooth was renewed in 1882. To the other tooth nothing has been done; the filling inserted in 1869 still remains. I saw it a few weeks ago; I *presume* that it is devitalized, but not being sure prefer to let it alone.

Whether with present means to treat such cases I would again use arsenic I cannot say. They were exceptional cases that occur at long intervals. I do not at this time recall any precisely like them.

I had a lesson in treating sensitive dentine, while attending lectures in 1864, from which I have profited much. I was operating upon a young patient whose restless movements greatly embarrassed me. Prof. C. N. Peirce, then lecturer upon operative dentistry, passing through the clinic room, attracted no doubt by my patients outcries, paused for a few minutes at the chair. In a quiet tone he spoke a few kind encouraging words: "bear it patiently—it will soon be over—a little more courage," etc. The effect was magical; was it hypnotism? The patient settled back in the chair and remained perfectly still. In a few minutes the cavity was prepared and the trouble over.

I study my patients and endeavor to learn their peculiarities, and how best their attention can be attracted and held from the work in hand. This and sharp judiciously used instruments has with me to a great extent solved the problem of controling sensitive dentine. It is seldom, indeed, that I have recourse to an obtunding agent other than the dryness secured by the use of the rubber dam. Notwithstanding this I am not willing to say that arsenic should never be used; I would prefer to say "hardly ever."

Cleaning Impression Trays.

Dr. F. A. Green boils impression trays in sal-soda water after using modelling compound. This cleans them thoroughly.

[EIGHTEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

Q. What other materials, besides gold, tin, and amalgam are used for filling teeth?

A. Gutta percha, oxy phosphate of zinc, and oxy chloride of zinc.

Q. How is gutta percha regarded?

A. It is generally regarded as a temporary filling material, yet in places not subject to the trituration of mastication, it has been known to last and preserve the tooth which was filled with it for many years.

Q. What is gutta percha?

A. It is the inspissated juice of a tree, called the *isonandra gutta*, which grows in extensive forests in the East Indies.

Q. What do you mean by "inspissated juice?"

A. Inspissate means to thicken—so that the inspissated juice means that the gum, as it exudes from the tree, is thickened by the evaporation or absorption of the liquid menstrum it contains.

Q. What is the character of gutta percha?

A. It is tough and flexible, and in the crude state of a cream or chocolate color.

Q. How is it purified?

A. By dissolving it in hot turpentine, in chloroform, in benzol, or napthol.

Q. Is it affected by any of the ordinary agents taken in the mouth?

A. No. Water at and above 120° F softens it, but water at this temperature could not be taken into the mouth. None of the alkalies have any effect on it, but concentrated nitric acid rapidly disintegrates it with effervessing fumes, but this likewise could not be taken into the mouth.

Q. How is it prepared for the use of the dentists?"

A. To make it harder it is combined, while softened, with feldspar, lime, magnesia or silex.

Q. What is considered the best preparation of gutta percha for dental use?

A. "Hill's stopping."

Q. Why is it so called?

A. Because it was first brought to the notice of the profession by Dr. Hill.

Q. How is it prepared?

A. Pure gutta percha is mixed, while it is softened over a water

bath, with one part of quartz, one part feldspar, and two parts of quicklime, using as much gutta percha as will take up these finely powdered ingredients, without making it brittle.

Q. How should a tooth be filled with it?

A. The cavity should be prepared as all other cavities are prepared, slightly larger within than at the orifice, and before its introduction the material should be softened over a hot water bath. The cavity should be kept perfectly dry, preferably by the rubber dam, and the material introduced in small pieces, and packed by slightly warmed instruments. It is a good plan to coat the interior of the cavity with a solution of gutta percha, which is readily made with a little chloroform, and the cavity coated either with a minute pellet of cotton dipped into the solution, or by painting the interior with a small camel hair pencil. The excess of filling material may be removed with a very sharp lancet, or preferably with a thin hot instrument when the filling is situated between the teeth; or it may be made smooth by moistening a piece of tape in chloroform, and carrying this with a sawing motion between the teeth.

Q. How has it been suggested to use this material on the masticating surfaces of the teeth?

A. By placing over it caps of pure gold.

Q. How are these caps made to adhere to the gutta percha?

A. By soldering loops, staples, or headed pins to the under side of the caps, and then heating the caps, and when hot pressing them into the gutta percha.

Q. Is there any peculiar manner of using gutta percha which does not seem to be successful with any other material?

A. Yes. Dr. Bing, of Paris, France, was the first to make use of gutta percha in this way. He made one continuous filling, including a first upper molar and the two contiguous bicuspids bridging the spaces between these teeth with the material, and putting over all these teeth a pure gold cap to prevent wear from mastication.

Q. To what other use is gutta percha put in dentistry?

A. It is used in solution, under the name of *chloropercha*, for filling root canals. It has been used by some successfully for taking impressions of the mouth, and it has been also employed as a *counter die* to swage the cusps of gold crowns, by first softening the material, putting this within a brass or iron ferule, and while still soft pressing the die into it, and then after chilling it using it as a counter die.

Q. What about the zinc preparations for filling teeth?

A. Of these materials, the oxychloride of zinc and the oxyphosphate of zinc are the ones principally used.

Q. How is the material used?

A. The oxychloride of zinc comes to the dentist in the form of a powder and a liquid. The powder is the oxide of zinc. The liquid is the muriate or chloride of zinc By a union of these, a material is made which, when it sets, assumes great hardness.

Q. How is the powder made?

A. Precipitated carbonate of zinc is subjected to a red heat in a crucible which is luted, and the heat continued until the carboric acid is expelled, It is then ground to a fine powder. and is known as the oxide of zinc. This powder is generally of a yellowish color, and will not dissolve in water. It has neither taste nor smell, and dissolves in weak sulphuric or weak hydrochloric acids without effervessing.

Q. How is the liquid made?

A. The liquid is made from the chloride of zinc. The chloride of zinc is made by putting metalic zinc into hydrochloric acid until the metal is dissolved. A small quantity of nitric acid is added, and the liquid evaporated to dryness. The dried mass is then dissolved in water, and chalk added to it to neutralize the acid used, when it is again evaporated to dryness. This forms the chloride of zinc. A fluigrain of the chloride is taken and one ounce of water added to it. This makes the liquid which is used with the powder.

Q. For what purpose is the filling material made from the union of this powder and liquid used?

A. It is esteemed favorably by some dentists as a filling material for root canals. It is used as a filling material in dead teeth to strengthen the weak enamel which has been deprived of its dentine. It was used and may be still as a capping to nearly exposed or entirely exposed pulps, but owing to its escharotic action it has not proved successful for this purpose. It is thought for this reason that the pulp will die under one of these fillings even though it may not be very nearly exposed. It is not as much used now as formerly, and is only regarded as a temporary filling material. Its use has been greatly superseded by the oxyphosphate of zinc.

Q. In what respect do these two materials differ?

A. In the liquid used to form them into a material for filling teeth.

Q. Is the powder the same?

A. Yes.

Q. What is the liquid?

A. It is a syrupy solution of glazial phosphoric acid.

Q. How is this used?

A. By combining the liquid with the powder a mass is made, which is used for filling teeth and other purposes in dentistry. Like the oxychloride it is regarded only as a temporary filling material. It is less irritating when introduced into a cavity in a tooth, and it seems to be more lasting in the mouths of some persons than others. It is used for strengthening the weak walls of enamel in excessively decayed teeth, for filling deep and large cavities, both as a preventive of thermal shock and as a means of economy in the subsequent use of gold, which may be placed over it: for the setting of all gold, or gold and porcelain crowns and bridges; for the attaching of bands to teeth used with regulating appliances. It is very sticky in its nature, and adheres firmly to the tooth substance, and for this reason, undercuts or pits are unnecessary, when using it to fill teeth. It may be built out to the coutour of the tooth, and by combining it with different pigments the color of the adjoining teeth can be closely matched. It is better suited for all gold crowns than for cases of crowning where a dowel enters the root canal, for in the event of a fracture of the porcelain crown, the material gets so very hard that it takes a long time, as well as great patience, to drill out or remove the broken dowel from the root. It is not esteemed a good material for root filling, but fills a valuable place in dentistry. The oxyphosphate of zinc does not mix as readily as the oxychloride, and requires some little experience in making it. It should not be mixed so thin for filling teeth as to be sticky, nor yet so stiff as to be crumbly, but it should be so incorporated (liquid and powder) that it can be rolled between the thumb and finger without unduly sticking to them. The cavity in the tooth should always be prepared before commencing to mix the material, and all the instruments necessary be ready at hand before introducing it into the tooth. In cases where the cavity has no undercut, it is well to smear a little of the sticky mixture to the walls before filling the entire cavity. Ball and other style brunishers are used for filling with this material. It should be kept perfectly dry until it hardens completely, when it may be scraped or cut into shape or contour with thin scalers, chisels, polishing tape or fine sand paper disks in the dental engine. It is recommended before removing the rubber dam to coat or cover the entire filling with either sandarac varnish or chloropercha. Where a pulp has to be devitalized, and the cavity of such a shape or nature that other materials cannot be used to retain the paste, the devitalizing agent may be well secured by covering it with some of this material used soft and sticky.

[TO BE CONTINUED.]

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED BY THEODORE F. CHUPEIN, D.D.S.

Dr. Wm. Trueman read a paper entitled "What are the best methods for obtunding sensibility of the dentine by either local or general means? Should arsenic ever be used?" These papers being called forth by a series of questions proposed by the American Dental Association's Committee on State and local organization. (See papers in this number at page 1 and below on page 13)

DISCUSSION.

Dr. Roberts endorsed all that Dr. Tineman said. He was opposed to being hampered in the use of any medicine he thought fit to use. Although he did not use arsenic for obtunding sensitive dentine, yet there were cases where something must be done, and when such cases presented he wanted to have his hands as well as his head free.

Dr. Chupein did not remember ever having used arsenic to obtund sensitive dentine but once, and does not know if it resulted in the death of the nerve in this case, as the patient never returned. Leaving the question, he related an experience of the application of arsenic to devitalize the pulp, when the tooth turned "a pink color" from the effects of the arsenic. On general principals he was opposed to its use for the purpose specified in the question, yet thought that there might be cases where its use was indicated as a heroic alternative.

Dr. Roberts had had a case of a tooth "turning pink" by the application of arsenic, similar to the experience related by Dr. Chupein.

Dr. Keyser said this effect was produced by making the application of arsenic when the pulp was in a highly congested condition. The same effect would not have ensued had the congested condition been first allayed.

Dr. Bonsall, to whom question No. 5 was assigned, namely: "What are the best forms of partial lower dentines and the methods of constructing the same," not being present, no answer to the question was made.

Dr. Roberts read a paper on question No. 6, namely: Corrective Dentistry: its present status; what are the simplest and most universally applicable forms of apparatus and most effective retaining appliances."

There seems, practically, to be no limit to what can be accomplished in correcting deformities or irregularities in the position of the teeth or shape of the jaws, provided the patient has patience enough, and

the dentist knowledge and perseverence sufficient to complete the operation.

If there is any portion of dentistry which deserves to be made a separate or special department of the science, it is "corrective dentistry."

There are comparatively few men who possess the necessary qualifications to satisfactorily perform many of the cases of regulating without special instruction, and who have had opportunity of receiving such instruction. The man in full active practice feels that he has not the time to devote to a regulating case, and probably has not had sufficient of it for it to come easy to him to do, and it annoys and worries him, and is painful to the patient, and they both wish they had kept out of it. I believe that regulating in nearly all cases is not necessarily a painful operation, and yet that most of the suffering comes from inflammation of the soft tissues, caused either by improperly used or improperly constructed regulating appliances, which pain can and should be avoided. It is more an annoyance than pain, and the first few days are the worst part of it.

Much has been and can be done with various forms of vulcanite plates with springs, etc., attached thereto, so that the patients can remove them, or they may be ligated or fastened in place. As a rule they are troublesome to both patient and dentist. I seldom use them, being able generally to find something better and easier.

They look simple and easy, but seldom "pan out" as expected.

For comfort to the patient, ease and satisfaction to yourself, cement metalic bands to the teeth and make attachments either of screws or springs or both to the bands. Retaining appliances should, generally, be constructed in place and be so made that the patient can keep things clean by brushing and not be able to remove them.

A universal regulating appliance is an impossibility, so also is a universal medicine, one can be found as easily as the other.

Understanding the law of forces with the knowledge to apply them (?) will go far towards making a universal *regulator* who will make the appliance for the cases presented to him, many of the appliances would be similar but hardly ever would two be alike. Instead of looking for a universal appliance which you can make applicable to all cases, it would be better and easier to look for a competent specialist in the correcting of irregularities of the teeth, and put the case in his hands. Each case has an individuality of its own.

DISCUSSION.

Dr. Trueman thought that this department of dentistry should be

relegated to a specialist, as it would thus be a benefit to both the patient and the specialist. The character of cases, when one had nothing but this kind of work to do, would become so well and quickly recognized that the specialist would know exactly what to do, whereas if they are divided, the non specialist or general practitioner had to study the case, and try different plans before he could arrive at the plan most applicable to the case in hand.

Dr. Keyser had a case of irregularity, where he believed the deformity or malposition of the teeth was due to the too early extraction of the sixth year molars. The lower teeth inclined towards the tongue at a considerable angle, and the upper teeth inclined inwardly also.

Dr. Robert did not think this malposition was due to the early extraction of the sixth year molars, but to some other cause. He believed that when the sixth year molars were so much decayed, and their preservation was found impossible, the sooner they were removed the better.

Dr. Trueman did not think it best to extract the sixth year molars until the bicuspids were developed, so that the patient would have these teeth to chew on. He did not know that the early extraction of these teeth would produce the deformity spoken of by Dr. Keyser, but he thought it best not to permit the patient to use the front teeth to chew on, which he would have to do if the sixth year molars were removed before the bicuspids were in place and able to take on themselves the strain of mastication.

Dr. Chupein believed that this position of the teeth, which really could not be classed under the head of irregularity, was due more to nationality than to any assignable cause. He had noticed many French persons, or persons of French extraction, whose teeth took the position spoken of by Dr. Keyser, and yet were regularly placed in the arch.

The subject was then passed.

Dr. Chupein read a paper on "Interstitial growth," which was published in this journal for July, 1893, at page 97.

DISCUSSION.

Dr. Trueman was rather skeptical as to interstitial growth, and thought it was due to the grinding away of the teeth and the recession of the gums. He did not think there was any real migration of fillings, the noted changes of position he thought relative and not real, and farther said that a filling in course of time changes its position relative to the gum line or to the masticating surface of the tooth is a

common observation. He had seen many instances of fillings years ago inserted upon the bucal, labial, or approximal surfaces in positions quite remote from the masticating surface, and had noted their approach nearer and nearer the masticating surface; in some instances this has gone on until the filling and cavity had entirely disappeared, this too without any noticeable shortening of the tooth. Indeed, it is very probable that a cast from an impression taken at the time the fillings were inserted, and another from an impression taken when after a term of years the fillings had apparently greatly changed their position, would show but little difference in the size of the teeth. This, however, is no evidence of any intertissual growth, or of any real migration of the filling. There has been a gradual wearing away of the masticating surface and "pari passu," a gradual recession or condensation of gum tissue, and possible a pushing out of the tooth; the tooth has really become shorter, but the gum recession and the wearing of the masticating surface so nearly corresponding in degree that the exposed crown portion remains of nearly the same length. That this is the case we have proof in the fact that the extracted tooth of a young but matured patient is very much longer than the corresponding tooth extracted from an aged patient; we commonly say that they have longer roots. And again, we all note that when the anterior permanent teeth first appear they are deeply notched or serated upon the cutting edges, that after a time these notches disappear without any apparent shortening of the teeth. And again, if we observe teeth marked by horizontal furrows we will find that these markings gradually approach the cutting edges, just as an immigrating filling is observed to do. It may be objected that if this explanation be correct there would be at the gum line a preceptible exposure of the root portion of the tooth. In many cases there is; in others it is not so noticeable. In early life the enamel may extend far below the gum line, and may so blend with the covering of the root that an extensive gum recession may make no very noticeable change in the appearance of the tooth at this point. In all these cases, however, there is a very marked change in the curve of the labial or bucal face of the tooth. The inward curve at the masticating surface so noticeable in the perfect tooth, has been lost showing unmistakable evidence of a loss of tissue. This loss of tissue is quite as likely to be due to that dental enigma, erosion, without actual contact with the opposing teeth, as to real mechanical wear. To these who may be interested in testing the migration of fillings I would suggest, in addition to taking an accurate cast and marking thereon the exact position of the filling (it

would perhaps be better to take the cast after the cavity is prepared and before the filling is inserted), it would be well to make upon the tooth, between the cutting edge and the filling, one or more scratches or ineffacable marks, noting the same upon the cast, noting any relative change between these and the filling, and also, at the same time made a profile plaster impression of the gum and the full length of the tooth directly over the filling; this placed in the same position, or compared with a similar one taken after the lapse of some years would do much to settle the question, "Do fillings migrate?"

Dr. Roberts was also opposed to the idea of "interstitial growth," and believed it reconcilable to the manner advanced by Dr. Trueman.

Dr. Chupein would admit that there might be the variation of the thirty-second part of an inch between the gum line in childhood and the gum line in mature life, but that a filling could travel from the gum line, where such a filling had been inserted *at mature life*, (in the case of a large central incisor), a distance of fully one quarter of an inch and be finally expelled, without the tooth changing its shape or showing evidence of wear or grinding away, he had seen or heard or read no argument to convince him of, or refute what had been his experience in this line, nor to what he had been a witness. He was not wedded to the idea of "interstitial growth," and was even disposed to be skeptical, and he was open to conviction if the migration of a filling could be accounted for in any way to refute that most potent factor "the sense of sight."

But he had not as yet heard any theory or argument brought forward to refute either the cases referred to by Dr. Patrick's paper*, or of the cases of which he had kept a record in his own practice.

He could not see any wide inconsistency in such a belief. It was admitted that in many animals the teeth were dermal appendages, and in some animals the teeth grew like the nails and hair in man. In man, as in most mamals, the teeth were developed in separate follicles and the germs did not partake of these peculiarities of the hair and nails. But why should not the teeth retain, in some individuals, the peculiarities that we notice in some animals? It might not be general, it is true, but cases of interstitial growth might show itself on isolated occasions. We know that peculiarities of disposition crop out in many individuals. Thus the *secretiveness* of one individual will be ineradicable, while the *open, fearless and generous* disposition of another will be as forcibly prominent. This one will pass his life in the *acquisition of money*; the other will not be content until he

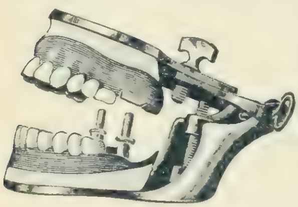
*See Dr. Patrick's paper at page 100 of this journal, in the July 1893 number.

spends his last penny. One man may be relied on for his *truth*, the other can't help *prevaricating* to save his life. If the mind be imbued with these proclivities, why may not other organs.

We do not know that this is the case, but bring forward the argument to account for the peculiarities we sometimes witness—as for instance in cases of interstitial growth.

DR. STEDMAN'S SPRINGS FOR DENTAL PLATES.

Dr. Stedman of La Porte, Indiana, has invented a device which is intended to supplant the spiral springs formerly used to keep upper and lower plates in place. Delicate springs are encased in tubes, which are set perpendicularly into the rubber plate in rear of the first molar of the lower jaw, while planes are set into the upper plate in



rear of the first molar of the upper jaw. Twelve teeth are used on each plate in lieu of fourteen, the springs and plates occupying the places of the farthest back teeth. While the springs thus encased are very delicate, they are sufficiently strong to keep the plates in place, and permit the lateral, as well as the up and down motion of the jaws, and to avoid the irritation sometimes caused by the spiral springs, against the mucous membrane of the cheeks. They stand out of the way, and do not collect the food as do the spiral spring, and are highly spoken of by those who use them on their plates, as is evidenced by the testimonials published by the inventor.—Ed.

REPORT OF THE CORRESPONDENT.

By Rodrigues Ottolengui, M D. S.

Read before the Dental Society of the State of New York, at its Twenty-fifth Annual Meeting, held in Albany, May 10th and 11th, 1893.

The report this year, at last, is a compilation of the opinions of experts upon a question of practice vital to us all I allude to the treatment of necrotic conditions in the oral cavity.

I addressed a letter to ten eminent dentists, and to an equal number of prominent oral surgeons, with which I enclosed the following communication :

A suit for damages was recently brought in a Brooklyn court against a New York dentist, in which the claim was, that a root had been improperly crowned, so that when finally lost, necrosis had occasioned the loss of a part of the jaw and an adjacent tooth. An

affidavit from the attending physician stated in substance, that when called the patient was in bed with high fever, and great inflammation about the teeth. He treated the patient for several days, reducing the fever and enabling her to get out of the house, when he took her to a dentist and had the teeth extracted. The defense claimed that the loss of bone was the result of delay on the part of the physician, who should have called in a dentist and had the teeth extracted at his first visit. On this point three dentists testified for the defendant that the physician had erred; that the teeth should have been removed, despite the inflamatory symptoms, and regardless of the presence of necrosis. They argued that the teeth were the source and cause of all the irritation, and should have been removed promptly. The expert for the plaintiff, also a dentist, re-called in rebuttal, testified that the physician's course had been a wise one. That if necrosis were present, or if caries were present, with a possibility of necrosis ensuing, it would have been hazardous to remove the teeth during the continuance of the fever, and in the presence of great inflammation. He claimed that the teeth were no longer involved; that though the primary cause of the disturbance, the disease had now left the roots, and was seated in the bone itself. He predicted that had the teeth been removed, the necrosis would have spread to other teeth. In explanation, he claimed that the wound left after removal of teeth from a necrotic jaw is continuously open until the necrosis is eradicated; that these gaping wounds offer free access to further infection, and that therefore the retention of the teeth is often advisable, the operation being rather upon the necrotic sequestrum and carious bone, the teeth being removed, if at all, after fever, inflammation and necrosis have been controlled. He even claimed that premature extraction might endanger life.

Subsequently to this trial, a prominent gentleman of Philadelphia read a paper, in which he advocated the extraction of diseased teeth to prevent spread of disease. He is reported in the *Cosmos* for April, and the following paragraph appears on pages 278-9:

"There was recently brought to my office, by his family and consulting physicians, a young man suffering with severe alveolar abcess upon the right lower first molar. The second molar, they said, had been extracted about ten days before, with no relief resulting therefrom. The inflammation by this time had extended from the wisdom tooth anteriorly to the cuspid, with evidence of necrosis about the first bicuspid. I recommended the removal of the first molar and both bicuspids, hoping it would arrest the progress of the disease.

though personally I was in doubt about saving the cuspid. I have found in cases of progressive necrosis, that it is necessary to remove at least one tooth beyond the line limitating the inflammation, but in this case we all desired, if possible, to save the cuspid. Upon operating, I found the root of the second molar had not been extracted, and was the origin of the whole trouble. This, together with the teeth above mentioned, was removed, and the bone found perfectly necrosed from the wisdom tooth to the septum between the bicuspids. Hope was entertained that the disease would go no further, but in a week the physicians brought him back with the characteristic blueness and spongy condition of the gums extending to the right central incisor, which necessitated the removal of the cuspid, lateral and central, and the cutting away of the process. The parts were healing nicely where the former operation had taken place. Within a week a third visit was made, with the disease extending to the left cuspid. The patient by this time was very much run down, and fears were entertained for his recovery. I urged that the operation should include both left bicuspids, though they did not show any evidence of disease. With this we succeeded in checking its progress. The poor fellow had lost twelve teeth, and the whole aveolar process about them, as a result of allowing the root of one abcessed tooth to remain."

This history is given as a warning against the non-extraction of teeth, but this question arises : Is the last statement of the essayist a true conclusion? That is, did the extensive necrosis and loss of twelve teeth result from the non extraction of the abcessed root; or on the other hand, was it the result of his wholesale extraction of neighboring teeth, instead of the removal of the second molar root only, and proper operation upon the necrosis?

This case, cited in an argument to prove that diseased teeth should be promptly extracted, reports exactly the result prophesied by the expert in the lawsuit, in that the necrosis spread, and life was endangered.

The final determination of this serious question is one of the utmost importance to our profession, not only in our actual labors, but in a decision of what shall and what shall not constitute mal-practice in such a case.

Will you therefore express your opinion for the benefit of the New York State Dental Society, upon the following points :

(*a*) Where necrosis is present, or suspected, with high temperature, and extended inflammation, would you extract the teeth

promptly, or would you reduce the temperature and inflammation first?

(*b*) There being no high temperature, but inflammation and necrosis, would you remove the tooth and adjacent teeth, or would you retain them, operating upon the necrotic tissues only?

In reply to the above, Dr. R. R. Andrews first wrote me a brief note, saying that he thought his opinion hardly worth quoting, but added: "My judgment would be at once to remove the cause, afterwards reducing the temperature and treating the inflammation."

A few days later he kindly wrote me again, inclosing a reply to my queries from Prof. E. W. Branigan, who is in charge of the Infirmary of the Boston Dental College. Dr. Andrews says of him: "He is as much an authority as any one whom I know in the dental profession."

Prof. Branigan writes as follows: "In answer to the questions forwarded, I should say, (*a*) extract at once, but take the precautions that a surgeon would take in an operation for necrosis. The use of an antiseptic, before, during and after the operation is, I think, omitted by the dentist more often than it should be; (*b*) I should remove all diseased tissues, and try to keep adjacent tissues in a healthy condition."

The following is from a reply sent by Prof. William Taft:

"In reply to your first question, I will say that if there were inflammation and high temperature in a patient whose history would indicate a scrofulous diathesis, which to a singular degree favors the determining cause of either syphilitic or tuberculosis necrosis, and which would lead me to suspect necrotic sequelæ, I should advise extraction as an abortive measure, and would loose no time in endeavors to reduce the temperature or inflammation. If the irritant is removed, these will subside of themselves. If the necrosis has already advanced, it is a matter of indifference whether the tooth or teeth are removed or not, as the disease would run to its limit and the teeth would be no factor in the process. But as they become painful and annoying to the patient, and interfere with mastication, it would be proper to extract for his comfort. To your second question, if the tooth were devitalized and acting as an irritant it should be extracted."

Prof. James Truman sends me the following opinion:

"My experience and reasoning have convinced me that after the necrotic condition has been established by osteitis, or acute inflammation of the periosteum, the teeth do not affect the progress of the disease and are not a factor in the treatment. The question of their

retention or extraction is one to be considered carefully, and is largely dependent upon the tooth or teeth, and the extent of the lesion, and whether the necrosis is confined to the alveolar process or has extended to the body of the jaw. There is an important distinction to be made here, for the former appears to be self-limiting and not ordinarily very extensive, while the latter may involve the entire maxilla. Where the alveolar process alone is involved, the teeth may be retained until removal of the dead bone and reformation of tissue. My experience has not been very favorable in this, for the teeth having lost their attachment have become to that degree a source of offense. The difficulty is to determine the presence or possibility of necrosis. The diagnosis and prognosis have each an element of doubt until well-known symptoms are established. I have tried extraction of the teeth, as well as their retention, without any positive results in either case. If a tooth must be removed, it is immaterial whether it be extracted during high temperature or at a later period. The origin of necrosis is not as yet clear to my mind. The explanation ordinarily given that necrosis occurs as the consequence of any cause which sufficiently impedes the circulation in the neighborhood is doubtless true, but it is very frequently difficult to assign any explanation leading to the inference that it had arisen idiopathically. Such an idea, however cannot be entertained. Inflammation does not always produce it, or else there would be no escape for patients in alveolar abscess. Constitutional conditions favor it, and again it will start unquestionably from infection, though even that is difficult to prove, as a recent severe case demonstrated. There is no question but that necrosis once established in any bone, it will progress independently of all treatment or surgical interferance. It eventually is is checked by natural processes; but the cause of this is by no means satisfactorily explained. The following, from Holme's Surgery, gives that generally accepted: "The periosteum, or medullary membrane, as the case may be separates from the dead bone and becomes inflamed, a quantity of ossific deposit (more or less, accordieg to various circumstances) is poured out between it and the dead bone, and this deposit soon becomes converted into new bone, forming a sheath over the dead portion, by which the latter is enclosed or invaginated.' My own view is, that eventually it will be found that pathogenic germs are the cause of its origin. Its progress then can be understood, and the reason why it is 'impossible to lay down any rule as to the time at which a sequestrum may be expected to be ound separated from the rest of the bone.' In a severe case coming

under the writer's care, the disease began in the process of the right superior wisdom tooth. This tooth had been extracted by another dentist. The history of the patient was clearly syphilitic. The progress was continuous but slow, finally involving half of the superior maxilla. It stopped anteriorly at the lateral incisor. Why a line of demarkation should be thrown up at that central incisor will remain, it is presumed, without explanation, unless the germ theory be accepted. In a recent case with no special history, necrosis began in the right cuspid. An attempt had been made by a village practitioner to remove a bicuspid root. The presumption is that the periosteum became infected. The disease rapidly progressed until, when la t seen, it involved the left side as far as the canine. Everything was tried to stay its progress, such as extracting in advance, and careful antiseptic treatment, without avail. My experience in surgical interference has always been, if not bad, at least of no benefit. Even where portions of the jaw bone have been removed in advance of the progress of the disease, the results have been of no value. Hence the extraction of a tooth, as in the case mentioned, must have been merely a coincidence, as I cannot regard it as having and effect upon the final result. My treatment has always been of a waiting antiseptic character, preferably using hydrogen peroxide and a continuous wash of phenol-sodique. By this means I have kept patients very comfortable for months, or until such time as the sequestrum became loosened or ready for removal. To sum up the answers to the queries propounded, I would say: (*a*) I would extract teeth promptly, with high temperature, but without any expectation of the result being affected one way or the other; (*b*) I would remove the teeth, there being no high temperature, as my judgment dictated at the time."

Prof. W. C. Barrett writes:

"(*a*) Extract the teeth promptly, as the source of the diseased condition, and as the continuously irritating cause.

(*b*) I cannot conceive of much inflammation without more or less of inflammatory fever, but as nearly as I can comprehend the case, I should remove the necrosed bone and tissues, and with that might come the teeth which were involved, I am not ready to say that I would remove either immediately, as the symptoms might point to the formation of sequestrum and slough, and in that case I should simply assist that solution of the difficulty. If I found it necessary to operate, I should endeavor to go back far enough to reach the limit of the extreme osteitis which would be present.

Of course the constant use of antiseptic washes and dressings would be indicated, with such constitutional treatment as the case demanded, whether the predisposing cause was in a distinct diathesis, or a condition of atony.

It is impossible to make a clear diagnosis of any case, to give an intelligent idea concerning the prognosis, or to indicate any positive course of treatment, without seeing and watching it from day to day, and taking note of the many and constantly varying conditions which govern the course to be pursued."

Prof. G. V. Black sends the following:

"In the letter received from you to day, you relate two cases of necrosis of portions of the bones of the maxillæ which seem to have resulted from alveolar abscess, and you ask my opinion as to whether or not the offending teeth should be extracted in the stage of inflammatory movement and fever which usually accompany these cases.

In answering your questions I cannot now go much into detail, but will give my opinion in brief. The danger of extensive necrosis in these cases principally depends upon two factors. First, the violence and duration of the inflammatory movement, and of the rise of temperature accompanying it. Second, the physical condition of the patient.

The character of the infection is probably important, but we have not as yet sufficiently accurate knowledge of this variation in the different cases upon which to-base a definite opinion.

The inflammation is due to infection from the root canal, either not filled, imperfectly filled, or from secondary infection through the blood, in an old and imperfectly healed abscess. In any case, either the root canal or the tissues immediately surrounding the apex of the root contains the active or exciting cause of the trouble.

Therefore, theoretically the immediate removal of the tooth, and with it the exciting cause of the difficulty, so far as may be, is demanded in all cases in which the conditions seem to threaten serious injury to surrounding parts. I should say that the greater the inflammation and the higher the temperature, the more urgent the demand for immediate extraction. I speak now of the stage of active inflammatory movement, not of the stage of suppuration following it.

My own practical experience in these cases most strongly supports the theoretical deductions. Within my observation, serious necrosis following extractions during the most severe inflammatory movement have been exceedingly rare, as compared with those occurring where extraction has been delayed. Relief following extraction, and

the apparent prevention of the further spread of the inflammatory movement, has been so general that I have no hesitation in saying that this rule should usually be followed.

Now, as to the second point, the condition of the patient. In most cases of extensive necrosis from the alveolar abscess or other cause, there is evidently a constitutional taint, which may be temporary, and on account of some infection of the general system, which under favorable conditions would soon pass away, but which favors the progress of suppuration. This condition, or better, those conditions, for I do not suppose it to be always the same, are not very directly under the control of the physician, and judgment as to their influence can not be definitely made in advance. We often see in these conditions metastatic abscesses occurring, and necrosis taking place in different parts of the body, without apparent local cause. If such a condition be recognized, or strongly suspected, certainly it would be wrong practice to allow an active inflammation to progress from a known point of infection so easily removed as the root of a tooth.

The danger of infection after extraction is hardly to be considered. Of course infection of a grave character might occur after extraction. I have seen several such, but when we consider the number of extractions that occur, certainly the number of serious infections following are not sufficient to deter one from extracting a tooth in a case of special necessity.

When extraction has been unavoidably delayed until suppuration is in full progress, and pus is discharging, the demand for immediate extraction is not so urgent, and in many cases may well be delayed. Yet, even in this case, extraction should be the general rule, though it cannot be expected that it will prevent an injury that is already accomplished.

As to a progressive necrosis, of which you speak in one of the cases you recite, this always has a systemic cause back of it. Even though the original cause may have been strictly local, there has been more or less general blood poisoning, or general infection, before we have progressive necrosis."

In the above, Prof. Black distinctly tells us that he speaks of the inflammatory stage only, and not of the suppurative stage which follows. The whole tenor of his letter is in favor of extraction. In the American System of Dentistry, however, on page 950, volume I, I find that he says: "If this lesion is discovered early in the case, the parts should be well cared for until by natural process of absorp-

tion the necrosed portions are loosened; they should then be carefully removed. I have learned by clinical experience, that much of an alveolar process may be destroyed by necrosis from inflammation, without necessarily destroying the hope of saving the tooth. Many of those cases that prevent a very bad appearance, heal with surprising facility, with a little care." He then describes a case from practice in which the buccal plate of the alveolus and the septum between two or three teeth were lost by necrosis, the teeth being retained only by wiring, they had become so loosened, and yet Prof. Black succeeded in saving the teeth and restoring the process about them. The antagonism between these two opinions from one authority is more apparent than actual, as I must explain, rather than be thought to raise a quibble in order to lessen the value of the advice given in Prof. Black's letter. His direction for extracting is, as he says, during the acute inflammatory movement, whereas the teeth which he saved came to him during the suppurating stage. Yet in face of the possibilities of salvation which he himself points out in the secondary stage of the disease, might we not hesitate to follow the advice of extracting during the primary stage?

Prof. David W. Cheever writes.

"(*a*) Incise—leeches—salines—release pus—wait.

(*b*) Remove all teeth which were loosened by necrosis; operate on the necrosis *after* the sequestrum has loosened. Always incise the soft parts, cleanse and irrigate from the first."

Prof. Carl Heitzman writes as follows:

"In reply to your questions I would say that whenever necrosis of the alveolar process threatens, all that the dentist is allowed to do is to extract the broken root, which as a rule is the primary cause of the suppurative periostitis preceding necrosis. All the teeth involved in the process of periostitis should be left in place, until falling out at the slightest exertion of mastication, That the teeth should be extracted when the periostitis is progressive, in order to check the spreading of the inflammation, is an altogether mistaken idea. Some twelve years ago I had an attack of suppurative periostitis, resulting in necrosis of the left side of the lower jaw. The trouble was caused by a broken root of the first left inferior bicuspid. The inflammation was intense, the fever high. In fact it was the worst ailment I ever experienced in my life. The broken root was extracted, with the result that the second bicuspid became loose and fell out. A few weeks afterward a necrotic piece, almost half an inch in length and a quarter of an inch in breadth, was loosened and removed with my

fingers. The first molar, a large healthy tooth, had lost the socket of the anterior root, but the posterior remained unchanged, and is ever since fastened in its socket, keeping the tooth useful. This fact plainly shows that the too hasty extraction of teeth during suppurative periostitis is not a legitimate procedure. In this assertion I am supported by Prof. Ros·, of Tubingen, Germany, who after an extensive experience in necrosis of the jaws, claims that we should abstain from the extraction of teeth, even in the worst cases, since after elimination of the necrotic bone, the teeth, even though much loosened, may become impacted in newly formed bone tissue, and remain serviceable for a lifetime."

Prof. Roswell Park, of the University of Buffalo, answers thus:

"Absence from town, with many cases and duties when at home, have conspired to cause unavoidable delay in replying to your favor of the 30th. Let me now say:

(*a*) I have never regarded high temperature, local inflammation, or even gangrene, as anything, but existing and urgent reasons for getting rid of whatever necrotic material may be present, either as active or concomitant cause; and I believe this general principle to be as valuable in dental work as elsewhere in the body. Dead tissue of any kind means septic organisms in overwhelming numbers, and removal of the same means riddance of exciting causes of inflammation, and toxic infection. The *first* indication is, then, to remove such material as thoroughly as possible up to a limit where tissues appear so healthy as to be capable of resistance to further encroachment. Here is where the greatest judgment is called for, in properly estimating these appearances.

(*b*) I think the above covers the answer to your second query. I would remove all necrotic tissue, whatever it were, and however widely it might extend, and I would then reinforce this measure by such active cauterization of the parts as to make some active bactericidal agent (bromine, or Zn Cl. e. g.) penetrate and saturate the surrounding tissues, and incidentally sear and clothes the mouth or outlets of the absorbents.

I think no such operations on the mouth, as your paper mentions, should be done without abundant use of antiseptic agents for some days thereafter."

This ends my list of replies on hand. A few gentlemen wrote, begging to be excused for lack of time. Two replies expected from Europe may reach me in time to be added to a supplementary report. Dr. George Fowler, one of the most eminent oral and general surgeons in

Brooklyn, promised me a reply, but I presume pressure of business has prevented. In a conversation with him recently, he stated most positively, that in the presence of necrosis the teeth have ceased to become a factor, and that extraction or retention would probably have little effect upon lessening the progress of the disease. He condemned the idea advocated by Dr. Thomas in the quotation which I made from his paper, wherein he says that in progressive necrosis it is wise to remove one tooth beyond the extreme line of inflammation. Dr. Fowler claims that thus to remove a healthy tooth, rather than the limiting of the disease, simply offers fresh exposed territory for infection, a hazardous procedure in the presence of a suppurating disease in adjacent territory.

I believe that the publication of the above letters presenting divergent views adjacent to each other, will be of value. It will attract attention to the fact that we have much yet to learn before we can know. And the fact is most emphatically hear shown, that of necrosis we know deplorably little. Prof. Truman gives us a most valuable expression of opinion. Yet though he says that extraction cannot be looked upon to limit the disease, and though he admits that surgical interference has been baleful, or at least ineffectual, and though he cites two extreme cases of progressive necrosis, in the history of each of which there is a report of extraction during the primary periostitis, nevertheless he sums up by advising extraction.

It seems to my mind that extraction in the presence of progressive periosteal inflammation, where suppurating threatens as a certain sequence, is a purely empirical practice. It is a doing of something when we know not just what to do. Our literature is full of just such cases as that of Dr Thomas, the two cited by Dr Truman, and Dr. Heitzman's personal experience, and yet the historians usually fail to see any connection between the extraction and the subsequent extensive necrosis, as a simple matter of cause and effect.

My own knowledge on the subject was the first acquired from the teachings of Dr Atkinson. I will relate a case which will be instructive. A number of years ago, I attended a meeting of the New Jersey State Society, at Asbury Park. I was down for a clinic, and a lady boarding in the house was brought to me as a patient. Examinations showed that there was a suppurative periostitis present about the central, lateral, cuspid, on the right side above. Her temperature was high; in fact, she had risen from bed to attend my clinic, hoping to get the relief which she failed to procure from the local practitioner. I sent her back to her room, and called Dr.

Atkinson to accompany me in consultation. We decided that necrosis was already present. She asked Dr. Atkinson if it would not be the quickest way just to have the teeth extracted. "Madam," he replied, "that will be the quickest way to lose your jaw bone, and perhaps your life." She entrusted her case to me, and I accompanied her from Asbury Park back to New York. Arrived at her home, she requested a consultation with her physician, and an appointment was made for the following morning. To my disgust, I found this physician to be a homœopath, and a fossil. He declared that he could cure the disease without my assistance, and I retired from the case. Two days later, as I subsequently learned, three loose teeth were extracted, and two months later the greater portion of the superior maxilla was removed by operation, having been destroyed by progressive necrosis.

It is a matter of wonder to the layman why men of prominence can always be found who go upon the witness stand as expert witnesses, and under oath testify to diametrically opposite medical facts. The explanation of this is simple. There are very few, if any, facts in medicine. Theories predominate, and these theories are dependent upon the varied experience of the men holding and teaching them. In the matter of necrosis, let us suppose that a perfectly good operator and scientific, conscientious gentleman, should follow the practice of immediate extraction, and should do so for, say ten years, without a mishap. Would he not be entitled to swear that extraction was the proper course of treatment? Obviously he woud. But suppose that on the day after, he extracts teeth under similar circumstances, and the patient grows rapidly worse, losing a large part of the jaw. Suppose that in his next case similar treatment resulted in death, as once occurred in Chicago, would that gentleman testify in favor of immediate extraction the next time that he was called? I think not. Thus it is, then. Those who have not seen evil results give us the negative testimony that extraction is a safe treatment, though oddly enough they do not explain what good accrues from it. Those who oppose extraction give us positive evidence based upon experience.

ALL THINGS DECAY WITH TIME; the forest sees
The growth and downfall of her aged trees;
That timber tall, which threescore lustres stood
The proud dictator of the state-like wood—
I mean the sovereign of all plants the oak—
Droops, dies and falls without the cleaver's stroke.—*Herrick.*

BOOK NOTICES.

A Practical Treatise on Mechanical Dentistry. By Joseph Richardson, M. D , D D.S., late Emeritus Professor of the Principles of Porsthetic Dentistry in the Indiana Dental College; formerly Professor of Mechanical Dentistry and Metallurgy in the Ohio College of Dental Surgery, etc. Sixth edition. Revised and edited by George W. Warren, D.D.S., chief of the clinical staff, Pennsylvania College of Dental Surgery, Philadelphia, author of "A compend on Dental Pathology and Dental Medicine," etc. With six hundred illustrations. Philadelphia: P. Blakiston, Son & Co, No. 1012 Walnut Street. 1893. Cloth, $4 50; Leather, $5.50.

This popular work has gone through two editions since 1886, for in that year we had its fourth edition, while that being exhausted a fifth edition was published, and now we have the sixth edition. In its present form it is offered fully "up to the times," all the old features and older modes being eliminated, and only the latest suggestions, devices, and plans being set forth. Six hundred illustrations, of finely engraved cuts, embelish the work, and make clear the ideas of the authors in their suggestions for the accomplishment of the work on which they treat. Among these are noticed and will be found the excellent method practiced by Dr. I. N. Broomell, of "Progressive counter dies," whereby a metal plate may be well brought up to the palatal surface of the arch, without wrinkling, defacing, or stretching the plate, while all the valuable suggestions in crown and bridge work which have been offered in works treating solely on this subject, may be found in this edition. The book is put on the market at the moderate price of $4.50 in cloth, and $5 50 in leather, and Dr. Warren, in revising and editing it, since the death of its author, has made the work so thorough as to leave room for little or no improvement.—Ed.

PRACTICAL PLACE.

Presence of Mind in Applying an Antidote.

An instance of rare presence of mind attended by success in the use of an antidote to poisoning occurred recently at Sag Harbor, N.Y.

Flora Sterling, the five-year-old daughter of Dr. Sterling, while playing about the house found a bottle which had formerly contained citrate of magnesia, and still bore the label. The child took a long swallow. With a scream she dropped the bottle and began to clutch her little throat in an agony of pain. He father, who had heard her screams, found that what the little one had taken for citrate of

magnesia was oxalic acid. Seeing that not a moment was to be lost, if he wished to save the child's life, the doctor looked about for an alkaline antidote. Seizing his pen-knife the doctor sprang to the white washed wall and scraped some of the lime into his hand. This he threw into a glass partly filled with water, and poured the mixture down the almost dying child's throat. The antidote took effect at once. The intense pain caused by the burning acid was alleviated, and soothing, mucilaginous drinks to cool the blistered mouth and throat did the rest.—*Scientific American.*

Truman (Jas.) on Temporary Fillings.

I never fill temporarily on the proximal surfaces without making a compound filling. To me it is a very great error to depend upon any one material for filling in teeth of that kind. We have a possibility of acid destroying the filling at the cervical border, and that fact should always be borne in mind. The red form of gutta-percha will resist the action of micro-organisms at that point better than any other. If the walls are coated with a thin layer of tin, and then upon that you build zinc-phosphate, you have very nearly a permanent filling. I am well aware from clinical experience that zinc-phosphate will dissolve in some mouths. I prefer to place in tin as a temporary filling where it is possible to use it.—*Extract International Jour.*

Cheney (C. D.) on the preparation of a Good Filling Material.

Gutta-percha stopping as prepared from the pure "chips" and oxide of zinc in the proportion of five of oxide to one of "chips," by weight, thoroughly incorporated at a temperature of 212 degrees, cannot be improved on. It is neither sticky, nor is it too hard; it softens at a moderate heat and, if not contaminated by dust or handling, it welds perfectly; it is non irritant in a degree equal to any filling material, and in a higher degree than many substances and solutions which are recommended for use over bare pulps. It is incorruptible, non-absorbent, a non conductor of all the materials used in filling teeth, and most compatible with vitality and comfort. It does not expand enough to fracture the merest shell of a tooth.—*Extract Items.*

Sensation to Heat and Cold in Teeth.

At one time a tooth pulp is sensitive to cold, and at another to heat. I think where they are more sensitive to hot applications that there is less chance of saving the pulps than when they are sensitive

to cold ones. It seems to show that the hyperæmia has gone on until it verges on congestion. There is more fluid in the pulp and in the surrounding tissue, and therefore there is less chance, to my mind, of saving the pulp.—*Dr. Robinson.*

Explosive Mixtures in Dentistry.

Chlorate of potash and tannin are favorite drugs with many dental practitioners. A correspondent writes the *Chemist and Druggist* warning others of the danger which he himself encountered. A dentist ordered two drachms of chlorate of potash and one drachm of tannin, and when these were mixed together in a mortar there was an explosion. Incompatibility of drugs should be thoroughly understood by dentists as well as physicians.

Odors in Oxyphosphate Fillings.

Any of us who have had occasion to remove a crown or bridge that has been in the mouth for several months or a year, as the case may be, have found in removing the oxyphosphate from the cap, a condition of things that is not desirable. The oxyphosphate seems to have absorbed everything that is applied to the mouth. It seems to me that demonstrates that oxyphosphate, or any of our cement fillings, will take up more or less of these gases, and more or less of this poisonous product or decomposition. Now if they will do that under a crown, even if the crown is pretty closely adapted to the tooth, will it not occur within a tooth, and would not the putting of a metallic substance or something similar between this cap and the oxyphosphate following, have a tendency to keep everything from the pulp itself?—*Dr. Robinson.*

Application for Poison Ivy.

Add half an ounce of impure carbonate of zinc to two ounces of lime water and two ounces of glycerine. Apply the mixture to the inflamed surfaces with a piece of soft, old muslin.—*Pharmaceutical Era.*

Phenomenal Number of Teeth.

Dr. O. Hildebrand, of Goettingen, reports in the *Medical Record* the case of a boy of 14 who, since the age of 12 years, has had 150 to 200 teeth of various sizes removed. A year and a half later 17 more were removed, with evidences of others coming.

THE

Dental Office and Laboratory.

FOURTH SERIES

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[TWENTIETH PAPER.]

OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia, Pa.

[CONCLUSION.]

IODINE.

Iodine was discovered in 1812 by a Frenchman named Constois. It is a non metalic element. It has been detected in potatoes, beans, peas, wheat, barley, and oats, and also in rain-water. It exists in sponges, oysters and eggs. It is largely present in seaweed, from which it is made by burning. It is of a bluish-black color in soft friable scales, having a high metalic luster. It has somewhat the odor of chlorine, and when it is heated passes off into vapor. The taste is hot and acrid, and when made into a tincture with alcohol, it produces a dark yellow or brownish stain on the skin. The stain of iodine may be removed with wet starch. If inhaled it irritates the nostrils and produces coughing. It dissolves freely in alcohol and ether, and but sparingly in water. It is soluble also in glycerine. It is recommended as a gargle in mercurial salivation. In large doses it is an irritant poison. It is an excellent disinfectant, but on account of the stain left by its use it is not generally employed as such in abscessed teeth, but it may be bleached with carbolic acid. It is used by the dentist principally for the treatment or relief of periodontitis, alveolar abscess, and all forms of mercurial inflammation and ulcers of the gums and mucous membranes of the mouth. For the fungous growths of the dental pulp, for suppurating pulps of decayed teeth, diseases of the maxillary sinus, recession of the gums. When painted on the gums for the relief of periodontitis, the lip should be held away until the tincture dries. Iodine seems to be more efficatious by mixing it with the tincture of aconite. When it is mixed with glycerine, Dr. Hammond claims that is a more effective local application.

Iodoform.

Iodoform was discovered in 1822, but was not proposed as a remedy until 1837. It is obtained by adding to an alcoholic solution of iodide of potassium heated to 104°, chlorinited lime, in successive portions, stirring after each addition, until the liquid ceases to assume a dark red color. When the solution cools a mass of crystals is deposited, which are iodoform and iodate of lime. By treating these with boiling alcohol the iodoform is alone dissolved, leaving the iodate of lime. It has very satisfactory results to the dentist in the treatment of alveolar abscess and putrescent pulp. Mixed with the oil of cinnamon it forms a pasty mass, which may be introduced in the root canals or into the external fistulas resulting from alveolar abscess. The odor is effectually disguised by the oil of cloves, cinnamon or sassafras. It relieves the pain following the extraction of teeth, particularly of those which had been affected with alveolar abscess. It is effective in an etherial or alcoholic solution as an injection in diseases of the antrum, and in pyorrhœa alveolaris, when combined with eucalyptus, oil. Iodoform, when combined with arsenic and carbolic acid and formed into a paste, makes a painless devitalizing agent. For this purpose 5 grains of iodoform are mixed with 10 grains of arsenic and sufficient carbolic acid to form the paste which is used in the way that nerve paste is generally employed. It has been regarded as a powerful germicide, but the investigations of Dr. Miller prove it to be anything but efficient as a destroyer of germs.

Leeches.

The leech has the general shape of a cigar, the body being spindle shaped, flattened dorsally. The surface is marked by a series of annulations, reaching from ninety to one hundred. The mouth opens into the pharinx, the structure of which, as in other *Gnath obdellidæ*, differs essentially from that of the *Rhynchobdellidæ*. The fundus is furnished with large clear cells having peculiar nuclei.

The leech is a hermaphrodite, but congress of different individuals is necessary for reproduction, and thereafter spermatophores, which have a special covering, are found in the respective vaginæ.

There is little difficulty in raising leeches. The largest leech farm is near Newton, on Long Island, consisting of 13 acres. The breeding ponds are oblong, each pond being 1½ acres in extent, with a depth of about 3 feet. The bottom of the pond is of clay and the sides of peat. The cocoons are generally deposited in the peat, and they have to be protected from their enemies, which are the musk-

rat, the water-rat, and the water-shrew, which dig the cocoons out of the peat.

A leech will fill in about fifteen minutes, and draws from 40 to 80 grains of blood.

Leeches are employed to relieve a conjested condition by local blood-letting. They are applied to the gum over the root of the affected tooth. The leech will bite better if the part to which it is desired that the blood be drawn, be smeared with cream or sugar, or the gum may be punctured so as to let a little blood ooze from it. The leech may be placed in a glass tube, and one end of the tube placed over the part where it is desired it should bite, when the tube may be removed. The leech will cease to draw blood after about fifteen minutes, and will drop off of its own accord, but if it be desired to remove it before, a little cold water acidulated with vinegar will cause it to cease sucking. Should the wound bleed after removal too profusely, the hemorrhage may be checked with such styptics as powdered alum, tannic acid, iodide of zinc or matico.

Monsel's Solution and Powder.

These are composed of the sulphate of iron, and are principally used for their powerful styptic properties for the arrest of hemorrhage after tooth extraction. The solution should be diluted before use, as it is liable to produce sloughing. It is applied on a pellet of cotton to the socket of the tooth. With the powder, the pellet is moistened in water, and a little of the powder is taken up and applied to the socket, when the remainder of the socket is filled with dry cotton and pressure brought on this by the teeth of the opposing jaw or by means of a cork pressing on the cotton and held in place by the teeth or gums of the opposing jaw.

Nitric Acid.

This acid is produced from sulphuric acid, by its action on the nitrate of potash. It is not extensively employed in operative dentistry except for the devitalization of the dental pulp when this becomes exposed from the attrition of mastication ; as also as a caustic for cancrum of the mouth. It has also been suggested, when a neat or delicate application of nitrate of silver is to be made, to dip a piece of pure silver wire in nitric acid and apply this to the part. Nitric acid is mostly used in the Dental Laboratory by being mixed with hydrochloric acid, when it forms *aqua regia*, employed to dissolve gold. It is used to dissolve silver and for other purposes in the Dental Laboratory. One of the nicest ways to prevent vulcanite from adhering to the plaster model on which it is molded, is to cover

the face of the model with thin tin foil, and when the case is vulcanized to immerse it in a solution of one part of nitric acid to four parts of water. The acid eats off the tin foil and leaves the surface clean, smooth and highly polished.

Nitrate of Silver.

This is obtained by dissolving silver in nitric acid, after which distilled water is added and the solution evaporated, when the crystals remain. These should be kept from the light, otherwise they turn black. These crystals may be formed into a pencil by fusing and pouring into molds. It dissolves readily in water.

Nitrate of silver is a valuable agent to the dentist. It is a powerful styptic and will frequently arrest hemorrhage when other agents fail,but has to be used with caution on account of its cauterizing effect. It is a valuable obtundent of sensitive dentine, but is not used for this purpose because of the black stain it leaves. It seems capable of arresting decay and has lately been highly prized for this purpose in the treatment of decay in children's teeth, where, from their restiveness or age, it is found impossible to remove all the decay from their teeth. For this purpose it has been suggested to clean out as much decay as can be done without inflicting pain, and then dip softened gutta percha in powdered nitrate of silver and pack this between the teeth The nitrate seems to neutralize or harden the decayed dentine, and arrests its farther progress. It is effective in solution for the treatment of root canals and putrescent pulp. Applied to those very sensitive decayed places at the necks of the teeth it neutralizes the decay, though leaving its black mark. It is useful in the treatment of cancrum oris and ulcers of the mouth. The pain of such application being relieved with a wash of salt and water.

Should it accidentally or purposely be swallowed in poisonous does, the antidote is common salt, as this converts the nitrate into chloride of silver, and this is discharged from the stomach by emetics.

Permanganate of Potassium

This medicine is in the form of dark purple crystals. A few crystals in a tumbler of water produces a beautiful lilac color and an effective mouth wash in cases of fetid breath. It has a sweet taste and slightly astringent. It is used by the dentist as a wash for ulcerations of the mouth, and for the treatment of abscesses and putrescent pulp; in diseases of the antrum; for toothache, by introducing a crystal in the decayed cavity; for necrosis of the maxillary bones, Riggs' disease and offensive breath. The stain left by permanganate of potassium may be removed with dilute hydrochloric acid.

Creta Praeparata or Prepared Chalk.

This is used by the dentist chiefly as a base for toothpowders. Being a powerful antacid it is indicated where there is a strong acid tendency. It relieves and obtunds sensitive dentine when produced from an acidity of the oral fluids. It is used in the Dental Laboratory for the polishing of gold, silver, rubber and celluloid plates, as also for polishing gold or amalgam fillings in the teeth.

Dialized Iron.

This is a preparation of iron deprived of the styptic taste and properties which iron preparations generally possess. The iron preparation is passed through a dializer, which is a porous diaphragm, and the crystaline are separated from the celluloid substances. It has not the excessive astringent taste and quality of the per chloride of iron, and is free from irritating qualities. It is the best preparation for internal administration, the dose being from five drops to one drachm.

Dialized iron is an antidote for arsenic, and has been recommended to neutralize its effects. Dr. D. W. Barker, of Brooklyn, N. Y., gives his experience with the preparation, which is valuable. He says: "To be sure arsenic should be so secured in the cavity as not to be permitted to escape, and all care should be used to prevent this. Nevertheless, it sometimes *does* escape, and cases occur where, despite every precaution and the use of even oxyphosphate fillings to retain it, ugly ulcers on the gum or mucous membrane of the mouth, show the irritating effect of the poison. Having had one of these to occur on the cheek from the escape of the arsenic, as large as a dime, I painted it every day with dialized iron, and the ulcer healed nicely with this treatment in less than a week, and prevented serious trouble. I feel sure that without the prompt use of this agent my patient would have had a bad sore. I regard it as a sure remedy for all such cases, and it deserves a mention in connection with the use of arsenic, when arsenic is used as a devitalizer of the pulps of teeth."

[NINETEENTH PAPER.]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

By Theodore F. Chupein, D. D. S., Philadelphia, Pa.

Q When a set of teeth is presented for examination and repairs, what instruments are used to ascertain their condition?

A. The mouth mirror and explorers.

Q. Can you describe them?

A. The mouth mirror is piece of round or oval looking glass, vary-

ing in size from a half inch to an inch or more in diameter, mounted in a case of metal on the back, attached to a long handle of ebony, ivory or mother of pearl, and placed at such an angle as to reflect the light, and to reveal the image from the back forward. These mirrors are sometimes made of quicksilver lenses of different magnifying powers. Explorers are steel instruments, terminating in fine points, bent at various angles, and well-tempered, designed to search for defective places in the teeth.

Q. When defective places are discovered in the teeth, what is the procedure?

A. Should such places be located on the crown or masticating surface of the tooth, we have found, especially if the tooth be in the lower jaw, to apply the rubber dam would be the best initiatory procedure.

Q. Is this invariably done?

A. No, some operators prefer to prepare or open the cavity before applying the dam.

Q. What are your reasons then for applying it before commencing excavation?

A. Because when the tooth to be operated on is kept perfectly dry, as may be done by the rubber dam, all the small ramifications of the decay can be more thoroughly seen and prepared than when the tooth is wet or moist with saliva. Beside this it has been observed that when a tooth is kept perfectly dry during the process of excavation or preparation of the cavity, much less pain is inflicted than when it is not.

Q. How was the moisture controlled before the introduction of the rubber dam?

A. Many devices were offered to control the flow of saliva during the operation of filling the teeth. First, small napkins were folded and applied on the gums around the tooth or cavity to be filled and held in place with the fingers of the left hand. As this did not permit the use of both hands to the operator, an appliance was suggested like a crib with a long handle, by means of which the patient could hold the napkin in place, and thus permit the use of both hands to the operator. Next it was proposed to place a wad of Japanese bibulous paper over the salivary ducts and the napkin over these, and the use of the napkin holder also used by the patient. After this small disks of pipe clay came into use. These were placed over the mouths of the salivary ducts, and held in place by suitable clamps. An appliance for suppressing the flow of saliva from the sub-lingual glands, was also much used at one time. It consisted of a chin plate

as well as a forked compressor, and a receptacle for the tongue made of thin porcelain. Japanees bibulous paper was placed over the salivay ducts, and the clamps applied by means of screws connected with the chin plate, while the tongue was controlled from movement by means of the porcelain receptacle into which it was inserted. Next it was suggested to control the flow of saliva by medicinal means, and some operators administered the one-sixtieth of a grain of Atropia for this purpose, about two or three hours before the proposed operation. This drug had a very marked effect of greatly diminishing the flow of saliva. But no appliance, of the many which have been suggested, so fully and effectually isolates the tooth, and keeps it absolutely free from all moisture, whether from the breath or the saliva, as the "coffer dam," or rubber dam, as it is called.

Q. Who first suggested the use of the rubber dam for this purpose?

A. There are several who claim the invention, but the honor of this great boon to dentists and patients, seems unequivocally to belong to Dr. S. C. Barnum, of New York, and he has received many valuable medals, and flattering testimonials in honor of his free gift of this great adjunct to operative dentistry.

Q. How long ago was it since he made use of the rubber dam?

A. Probably twenty-four years or more.

Q. Was rubber dam manufactured at that time?

A. We are not certain whether it could be procured in the form in which the dentists of to-day have it; but we have understood that Dr. Barnum's first use of it was in the form of the "toy balloons" which are sold for the amusement of children.

Q. What is rubber dam?

A. It is a partially vulcanized india rubber,

Q. How is it manufactured?

A The crude rubber is put into a mill. This cuts and tears the gum into minute particles; these particles are mixed with a certain portion of sulphur, and while the mass is in a pulpy or doughy condition it is rolled between a rolling mill of three rollers. This process reduces the material into sheets of varying thicknesses, after which it is vulcanized, and is then ready for the dentist, or whoever else uses rubber dam.

Q. How is the rubber dam applied?

A. One round hole is punched through the dam, with what is known as the rubber dam punch, if the tooth is an isolated one, and the dam is stretched over the tooth, this passing through the hole. The elasticity or contractile nature of the rubber being such as to

embrace the tooth so tightly as to be capable of excluding all moisture.

Q. What prevents the dam thus applied from slipping off the tooth?

A. First, all teeth are narrower or smaller at the neck than at the cutting edge or masticating surface, and therefore the dam will hold on this account; but dependence is not placed by dentists solely on the shape of the tooth to hold the dam in place. Other means are used.

Q. What other means?

A. Ligatures and clamps.

Q. How are these used?

A. When the dam is applied a ligature is passed around the tooth, on which a bead is threaded or a large knot made, and this ligature is tied at the neck of the tooth, above the dam. The knot or the bead forms a shoulder offering considerable resistance to the slipping off or the dislodgement of the dam. Clamps are devices made of thin sheet steel, of various forms designed for the shapes of the different teeth, and are used for the same purpose: viz., to prevent the dam from slipping off the teeth to which it is applied.

Q. How are they used?

A. They are applied by what is known as the "clamp forceps" This instrument acts inversely. Instead of the beaks closing when the handles are closed, the beaks open when the handles close. The bow of the clamp is placed between the beaks of the foreceps, so that when the handles are closed they force the jaws of the clamp open, and while thus opened the clamp is passed over the tooth. On releasing the handles the clamp resumes its shape and hugs the tooth, and thus effectually prevents the dam from slipping off.

Q. Is the clamp applied after the dam or before?

A. Sometimes after, and sometimes before, but oftener the clamp and the dam are applied simultaneously.

Q. Will you describe this?

A. In the case of an isolated tooth the dam may be applied, and to prevent subsequent slipping of the dam, while the cavity is being prepared or the tooth being filled, the clamp is then applied in the manner described. In other cases it is found more convenient to apply the clamp first, and then to stretch the dam over the bow and under the jaws of the clamp while it embraces the tooth. But it is generally applied simultaneously. To do this the jaws of the clamp are passed through the hole punched into the dam, and the beaks of the clamp forceps inserted in the bow of the clamp. The dam is then gathered up around the handles of the forceps, and the clamp dis-

tended so as to permit it to pass over the tooth. When this is done the dam is stretched with a suitable instrument (generally a ball burnisher bent at right angles) and stretched beneath the jaws of the clamp, so that the dam will embrace the tooth.

Q. You have described the application of the rubber dam over the isolated tooth; how do you proceed when the teeth are in close proximity?

A. The first effort in such cases is to pass a piece of waxed dental floss or gilling twine between the teeth. In doing this if the ligature be cut or frayed, it shows the presence of decay and sharp edges. Such sharp edges should be reduced to smoothness before applying the dam, as it follows to a certainty, that if the ligature is cut by these sharp edges, the rubber will be cut also in stretching it between such teeth. Next should there be any tartar adhering to the necks of the teeth this should be removed before attempting to apply the dam. These preliminaries being attended, two, and sometimes three or four holes are punched in the dam about one-sixteenth or one-eighth of an inch apart. If a molar and two bicuspids are to be encircled by the dam, the hole for the molar should be punched larger than the holes for the bicuspids. The jaws of a clamp for a molar are passed through this large hole, and the dam applied in the manner already described. The dam is then stretched beneath the jaws of the clamp and the remaining two holes stretched over the bicuspids. The ligature is used to force the septum between the holes in the rubber, between the teeth, when it may be tied in place and the work of excavation proceeded with, after the rubber dam holder is attached

Q. What is the rubber dam holder?

A. It is a device for holding the rubber dam out of the way of the operator over the cheeks of the patient. It consists of two clamping devices attach to an elastic band by which the rubber dam is held against the cheeks of the patient, so as not to impede the view of the operator while he is at work.

Q. Where are rubber dam clamps chiefly used?

A. On the molar and bicuspid teeth. They are seldom used on the upper incisors or cuspids, when these teeth are decayed on their proximate surfaces, necessitating the application of the rubber dam; but in filling these teeth on the *lower jaw* on these surfaces it becomes necessary often to use them. For filling the upper central and lateral incisors, and the cuspids on their palatal surfaces, or on their labio-cervical surfaces clamps are often indispensible.

Q. The moisture being excluded what is the next procedure in the treatment of deep seated caries?

A. The disorganized tissue is removed by instruments called excavators.

Q. What are excavators?

A. They are steel instruments bent on one end at various angles and terminating into small blades. They are of different sizes, and well tempered, and are used for removing the decayed tissues from the cavities of the teeth, and with other instruments called "burs" were at one time employed exclusively for this purpose, as well as for shaping the cavity for the retention of the filling material.

ILLINOIS STATE DENTAL SOCIETY.

The thirtieth annual meeting of the Illinois State Dental Society will be held in the Senate Chamber, Springfield, Ill., May 8, 9, 10 and 11, 1894. An interesting program is in the course of preparation. Practitioners of Illinois and of adjoining States are cordially invited to attend. LOUIS OTLOFY, Secretary.

OBITUARY NOTICES.

ABRAM W. SEE.

With sincere sorrow we learn of the death, on January 31st, at Arlington, N. J., of Abram W. See, of the firm of A. W. See & Co., of New York.

Mr. See was born in New York City, October 19th, 1844. He was a descendant of an old Revolutionary family, whose ancestors settled in the neighborhood of Tarrytown, N. Y., and a great grandson of Isaac Van Wart, one of the captors of Major Andre.

During his mercantile life he was identified with the Dental Supply business in New York City, and for the past eight years as a member of the firm bearing his name.

A man of the highest integrity, a thorough Christian and sincere friend; his loss will be deeply felt in all circles of his acquaintance.

It is with regret and sincere sorrow that we record the deaths of these honorable fellow-workers—Doctor Daniel Neall, Doctor Sam'l Dickey, and Doctor Wm. Reeder.

Of the two former, their names are among the patriarchs of dentistry, and their works will remain until those whom they have served will be, like them, gathered to the Father of all.

Dr. Reeder was among the younger practitioners, and by his sterling worth gave promise of an honorable and useful career.

Let us hope that, having fought the good fight, and acted in all

their relations to their fellow men with the full import of the "Golden Rule," they may reap the reward of the just.

Art is long, and Time is fleeting,
And our hearts, though stout and brave,
Still, like muffled drums, are beating
Funeral Marches to the grave.

Though not connected with Dentistry in any way, we feel prompted to give expression to our deep regret and sorrow at the death of our esteemed, beloved, and honored citizen,

MR. GEORGE W. CHILDS,
(who died on the 3rd of February)

His career has been, from early boyhood, when it may be said he came to this city unknown and friendless, a long catalogue of generous acts, good deeds, charity and general or universal philanthropy. His heart was ever as large as his purse, for even when his earnings were small he found means by self-denial and personal sacrifices, to contribute his mite to his fellow workers.

Men like Mr. Childs can ill be spared from any community, and the memory of the man, his generous promptings, his genial manners, his world-wide acquaintance, and emulative integrity, stand as beacon lights for the imitation of all.

Requiescat in Pace. ED.

CORRESPONDENCE.

In answer to W B. Frelton, Freshman Student of the Birmingham Dental College, Alabama, who writes us in relation to the question of whether an acid acts on a metal or a metal acts on an acid, we would say: That we have submitted the inquiry to a well recognized authority and teacher, and cannot do better than to quote his answer:

" Replying to your inquiry, so far as I understand the matter your answers to both questions—*a*. 'What is a metal? *b*. What is an acid?' are quite correct. It is difficult, if not impossible, to give a comprehensive answer to the first one, but the one you give is entirely correct as far as it goes. The reaction of a metal with an acid is a natural one between the substances involved, therefore it is quite as correct to say that the metal acts upon the acid as that the acid acts upon the metal. If you regard the result as a replacement of the hydrogen of the acid by the metal, as it is generally done, then it is correct to say that the metal acts upon the acid, thereby replacing its hydrogen. All acids, according to modern views, must contain hydrogen, and the replacement of its hydrogen by a base or metal liberates the hydrogen and forms a salt. The formula given for the action of aqua rigia on au. is quite correct."

AN ACT CONCERNING THE PRACTICE OF DENTISTRY.

GENERAL ASSEMBLY, January Session, A.D., 1893.

PASSED MAY 25, 1893.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

SECTION 1. The Governor shall appoint on or before the first day of July, 1893, and biennially thereafter, five persons to be known as dental commissioners, who shall hold their respective offices for two years from the first day of July in the year of their respective appointments, and until their successors shall have been appointed and qualified.

SEC. 2. No person shall be appointed a dental commissioner who shall not have been, for at least ten years previous to such appointment, a practitioner in dentistry in this State and in good standing in said profession.

SEC. 3. Said commissioners shall appoint one of their number to be their official recorder, whose duty it shall be to keep a record of the official proceedings of said commissioners, and copies of said record certified by him shall be legal evidence.

SEC. 4. On request of said commissioners the comptroller shall provide a suitable place in the capitol at Hartford, for all meetings of said commissioners.

SEC. 5. Said commissioners shall meet in May of each year and at such other times as they shall designate, for the purpose of attending to their duties as prescribed by this act.

SEC. 6. Said commissioners shall give due notice of every meeting to be held by them pursuant to the provisions of this act, by advertising the place of their meetings, for two weeks successively, in two of the daily newspapers published in said Hartford, and before the date of said meetings.

SEC. 7. Said commissioners may make such rules of procedure for the regulation of all matters of application and hearing before them as they may think advisable.

SEC. 8. No person, unless he has already commenced the practice of dentistry in this State before the passage and approval of this act and shall be engaged in said practice at the said time, shall engage in such practice in any town in this State, unless such person shall have first obtained from said commissioners a license therefor.

SEC. 9. All applications for such license shall be in writing and signed by the applicant, and no license shall issue to any person unless he shall have received a diploma or other sufficient certificate

of honorable graduation from some reputable dental college having a department in dentistry, and duly recognized by the laws of the State or States wherein the same is situated, or unless he shall have spent as a pupil or assistant at least three years under the instruction and direction of some reputable dentist, or unless he shall have had at least three years' continuous practice as a dentist, which facts must be shown to said commissioners by sufficient evidence.

SEC. 10. Nothing in this act shall be construed as preventing any practicing physician or surgeon from the performance of any operation in dentistry on any patient under his charge. Nor shall any lawfully practicing dentist be prohibited hereby from availing himself of the services of any pupil, student or assistant, employed by him and under his immediate supervision.

SEC. 11. Every applicant for a license shall be examined by said commissioners, as to his professional knowledge and skill, before such license shall be granted, and they may refuse to grant a license where they are satisfied that the applicant is unfit or incompetent; they may for good and legal cause revoke any license that has been granted and may prohibit any dentist in lawful practice from further practice, on satisfactory proof that such dentist has become unfit or incompetent therefor.

SEC. 12 Cruelty, incapacity, unskilfullness, gross negligence, indecent conduct towards patients, or any such professional misbehavior as shows unfitness on the part of the dentist, shall be sufficient cause for the revocation of a license, or prohibition to practice as above provided; and whenever complaint shall be made to any of said commissioners against any dentist practising in this State, said commissioners shall investigate the matter, and on finding probable cause shall notify the party complained of to appear before them and show cause why he should not be prohibited, or why his license should not be revoked.

SEC. 13. Every such notice shall be in writing, and signed by the recorder, and shall contain a statement of the causes for which such prohibition or revocation is claimed, and shall specify the place and time for the hearing, which shall be at least twelve days after the service of said notice. Said notice may be served by leaving a copy thereof attested by the recorder, at the place of business of the party complained of or at his last usual place of abode, or by sending the same by mail.

SEC. 14. Any dentist, who shall at any hearing before the commissioners, either by himself or by his procurement, make any false statement or misrepresentation with intent to deceive or mislead said

commissioners, shall thereby forfeit his license or be prohibited from practice.

SEC 15 Any dentist who is aggrieved by the action of said commissioners in the revocation of his license, or prohibition from his practice, may apply to the superior court or court of common pleas, next to be in session in the county in which he resides, for a writ of mandamus, requiring them to revoke their decision, if the same be found on hearing to have been erroneous. Such application for a mandamus may be served on said commissioners by some proper officer or indifferent person, by leaving with the recorder, or at his usual place of abode, a true and attested copy thereof within twelve days after said commissioners shall have notified such dentist of their decision.

SEC. 16. Every person applying for a license shall at the time of his application, pay to the recorder a fee of twenty-five dollars, and if such applicant shall fail to obtain his license twenty dollars shall be returned to him.

SEC. 17. The recorder shall keep an account of all moneys received by him and shall annually in November render his account to the comptroller; and shall pay over from the moneys received by him the necessary traveling expenses of the commissioners, and for necessary books and stationery, and shall keep all files, receipts and records in his possession, and deliver the same to his successors in office.

SEC. 18. Said commissioners shall make to the State Board of Health, an annual report of their proceedings, in such form and at such time as such Board of Health shall prescribe.

SEC. 19. Any person who shall engage in the practice of dentistry in violation of the provisions of this act, shall be guilty of a misdemeanor and shall be fined not less than twenty dollars or more than fifty dollars for each offense; and the unlawful practice of dentistry for one week or part of a week shall be deemed a separate offense.

SEC. 20. Sections 2024 and 2025 of the general statutes are hereby repealed.

DR. CIVILION FONES, President,
DR. GEO. L. PARMELE, Recorder,
DR. WM J. RIDER,
DR. CHAS. P. GRAHAM,
DR. RICHARD W. BROWNE,
Dental Commissioners of Connecticut.

The list of Commissioners has been incorrectly printed in some journals. G. S. CARMEN.

PRELIMINARY EDUCATION FOR DENTISTRY.

By L. D. S., Toronto.

It does not need much discernment to discover that to-day a high standard of preliminary education is desirable for entrance to the liberal professions. We wish dentistry to rise to this rank. No matter to what extent we extend the curriculum of scientific and practical study, we simply make it ridiculous if we do not exact some much higher preliminary standard than a common school education. It is no reproach to dentistry in the past that we have good operators who could not pass even the examination of a common school, much less that of a university; but few of these men are prepared to defend such ignorance as a passport to the profession to day. It is to our credit in Canada that our universities in law and medicine, as well as our boards of examiners in dentistry, require a classical and mathematical course as preliminary; but in dentistry it did not begin early enough, and some very good men as practitioners graduated as bell-boys and sweepers of the door step. I say this to their credit in one sense, yet I do not hesitate to declare that it should not be, and that as a rule it will be found, that whatever obstruction and particular annoyance we have had in our progress, can be traced directly to the "beggar on horseback" conceit and crankiness of this class. It was found to be so in other professions until a stiff preliminary was enacted. During some years' residence in the States, I learned this to be the fact in connection also with medicine, and a wonderful social and moral change has occurred by its exaction in the Universities of Pennsylvania, Cornell, Yale, Princeton, Lake Forest and North-Western Universities, Johns Hopkins and the University of Wisconsin. The Universities of Ontario and Quebec have always had a standard equal to that required of the Universities of Oxford, Cambridge, Durham, Edinburgh, Glasgow, and Dublin, even when there was none whatever of a classical and mathematical character in the United States. For instance, the College of Physicians and Surgeons, even of the old Province of Quebec, quite deterred me ten years ago, by sending me in reply to a request, a programme of the preliminary examination, requiring as obligatory subjects three authors in Latin, three in French, first three books of Euclid, also the measurement of the lines, surfaces and volumes of regular geometrical figures; algebra, including fractions and simultaneous equations of the first degree, with English, *Belles Lettres*, history (ancient and modern), geography, and one of the three following as optional subjects—Greek, Physics, Philosophy. A sound knowledge of the grammer of the languages was required. Failure in Latin, arithmetic,

or the mother tongue involved rejection. For a time this was the standard required to enter dentistry, but it was somewhat modified.

In Ontario to-day, candidates for the degree of Doctor of Dental Surgery must pass the examinations prescribed for matriculants in the Faculty of Medicine in the University of Toronto, unless they possess a degree in arts from a recognized university, have already matriculated in the Faculty of Arts, or the Faculty of Law, or the Faculty of Medicine, are matriculants in the College of Physicians and Surgeons of Ontario, or have passed the 1st, 2nd, or 3rd class departmental non-professional examinations in which the Latin option has been taken.

The faculties for obtaining such preliminary training, especially in Ontario, are better than ever, and I plead for it with all the emphasis possible. The social character of a profession has great weight in a community. I cannot pretend to explain it, but my observation of residence, both in the United States and in Canada, leads me to the conclusion, that if the bell-boys wants to be dentists, and there is no reason why they should not so aspire, they should be first compelled to prepare for entrance by a thoroughly good preliminary education. —*Dominion Dental Journal.*

IMPROVEMENTS IN DENTISTRY.

By F. J. S. Gorgas, M. D., D. D. S

The Greek historian, Herodotus, informs us that the Egyptians practiced the dental art, and in his second book he states that the art and practice of medicine was divided among the Egyptian priesthood, each physician and surgeon applying himself to one class of disease only: some to the head, others to the eye and others to the teeth: and, judging from the dental work found in some of the tombs of Egypt, we may conclude that the practitioners of that time were comparatively learned and highly proficient in one branch at least of dental art.

Among the Hebrews Moses legislated his famous law of a "tooth for a tooth," and the one who broke his fellow-man's tooth had to pay the sufferer a sufficient amount of money to have the substitute inserted. The Talmudical folk lore says: "If a man dreams that his false teeth have fallen out it is an omen that his children will soon die."

The Talmud allowed Jewish women "to go out on the Sabbath with their false golden or silver teeth." The Chinese of mediæval times appeared to be skilled enough to preserve the teeth. A Chi-

nese manuscript deposited in the French Academy of Science gives much information concerning dental practice in ancient China and asserts that their dentists possessed a wonderful power for the painless extraction of teeth. Even the Arabs paid great attention to their teeth. An Arabian General under Mohammed was slain, and his body could only be identified by means of his false teeth. The science of dental surgery was carried from Egypt to Greece. Homer tells us that Esculapius, who lived 1250 B. C., used a narcotic to produce insensibility when performing such an operation as tooth drawing, and the latter was the first Grecian who filled the teeth.

Cicero gives to the third son of Æsculapius the credit of inventing an instrument for the extraction of diseased teeth. The Temple of Delphi contains a pair of leaden forceps for the extraction of teeth which date back 2,000 B. C., and the 10th of the celebrated Greek Laws of the 12 tables allowed that any gold used to fasten the teeth might be burned with the body. The Greeks wore false teeth made of sycamore wood, which were fastened to the adjoining natural ones by ligatures of gold or silver, and decayed teeth were filled with a clay-like substance which became very hard and durable. Among the early Romans, Hippocrates treated of the teeth in his investigations of all branches of medicine, and gave many directions concerning the manner in which the dentation of the first set of teeth should be managed. The famous Martial, who lived in the first century B. C., speaks of a Roman dentist, Calcellius, as "in the habit of fastening as well as extracting teeth."

The instruments for dental and surgical purposes which are to be seen in the museums of Europe, together with the beautiful specimens of Etrurian and Phœnician dentistry, are very striking illustrations of the ability of the early dentists. Filled teeth, crown and bridge-work have been exhumed in various parts of Italy, Greece and Egypt, and were on exhibition at the Columbian World's Fair. Among the Etrurians dental science was studied and practiced as a branch of medicine, but, being imitative rather than creative, their art bore the marks of the Egyptian and the Grecian. Much has been claimed for the success of modern crown and bridge work, but the pre-historic dentists did the same ingenious work centuries ago. What the modern dentist can claim, however, is improvement in its construction and application. The Roman dentists filled teeth with lead, amalgam and gold and a fusible metal, as the tombs of the northern part of Italy proves, but it was only the nobles who were fortunate enough to receive the advantages of dental operations. During the Dark Ages all sciences and arts were completely neglected for the period

of 1,000 years, when the surgical portion of dentistry and medicine was delegated to the barber and blacksmith and the prosthetic branch of dentistry to the skilled jewelers of those days, and it was not until late in 1700 that dental science came again into the hands of men who began a thorough study of its principles, and for many years after this period its scientific practice was limited to a few intelligent men, to whom the credit is due of rescuing it from the down trodden trades and elevating it to its former and present dignity.

The crude extracting instruments of early days were at this period greatly improved, but still in accordance with the mistaken idea that force alone was necessary, and not such movements as were required by the anatomy of the parts. The key of Gazengeot succeeded the crude levers, and it was not until the latter part of the 18th century that the present style of forceps were invented. From 1835 to the present time many improved instruments for the removal of teeth from the jaws have been adopted, and to the late Drs. Chapin A. Harris and Edward Maynard, the former of this city, is due the credit, of originating many of the improved forms of forceps. Since their day, however, while the general forms remain, the shape of the edges of the beaks of these instruments, as well as of the beaks themselves, have undergone considerable change, thereby rendering their adaptation to the teeth more perfect and the use of the gum lancet less frequent, thus preventing much of the pain of such operations.

Although the use of general anæsthetics was known to the ancient Dioscorides, a Greek physician having administered mandrake—stropa mandragora—and morion, the former agent also being referred to by Pliny and Apulcius, and the Chinese and Hindoos using Indian hemp—cannable indica—yet later the use of such agents—appear to have been forgotten, or, if remembered, regarded as the wild fantasy of a barbarous age. It was not until within the present century that sulphuric ether, nitrous oxide gas, chloroform, bichloride of methyl, annyl and a number of other general anæsthetics were discovered. To practitioners of dentistry the discovery and application of such properties in ether and nitrous oxide is due. The fatality attending the use of general anæsthetics led to the application of local anæsthetics in dental practice, and at the present time comprise such agents as absolute ether, rhigolence, cocaine, and combinations of the latter with carbolic acid, pyreth rum, aconite, sulphuric acid, etc. The first of these local obtunders were ice and salt, spray of ether and rhigolene, in what is called the "freezing process," which,

however, have given place to cocaine and applications which are applied by injections with the hypodermic syringe.

The use of lead followed the hard clay-like substance for filling teeth, which in turn gave way to pure tin, amalgam of silver tin and mercury and gold, the tin and gold being in the form of thin leaves of foil. The use of the hand-mallet for condensing tin and gold in filling teeth was practiced some fifty or more years ago, and this form of mallet is still in use, an assistant, often a female, assisting. The improved mallets, however, are the automatic and electric, which enable operators of the present day to restore teeth with gold which were less than a quarter of a century ago considered irreparable. Improvements have also been made in the nature of the amalgams employed for filling teeth, much purer metals being used and greater care in their combinations being exercised. By the use of such amalgams teeth that, owing to their frailty, are unable to withstand the force required to condense gold properly are now rendered useful organs.

Great improvements have also been made in prosthetic dentistry. Artificial teeth were rudely inserted in days by bands attaching them to adjoining natural ones. Later both teeth and base were carved out of ivory or other bone, and, as a consequence, but ill adapted for fit comfort and use. Natural teeth, human and also those of animals, were attached to bone bases. Still later metallic plates holding mineral teeth were used, either clasped by bands to natural teeth remaining in the mouth, or in the case of full or entire indentures, held together on the jaws by means of spiral springs. At the present time artificial teeth, especially upper sets, are so well adapted to the mouth that the adhering force is atmospheric pressure, applied either by close adaptation, or by the aid of a vacuum cavity in the surface of the plate next to the plate. Lower sets when entire are so adapted by closeness of fit that attachment to the upper sets by means of the spiral springs is no longer necessary.

The form of work known as crown and bridge work although used by the Romans, has been so greatly improved that now many artificial teeth can be inserted without the aid of a plate covering the greater part of the roof of the mouth, provided certain natural teeth or even roots of teeth, remain so as to form points of vantage. Very frail natural crowns which cannot be preserved by filling can be protected and rendered useful for mastication by covering them with entire or open-faced crowns of gold so adapted to the teeth that what remains of them is imperishable.—*American Journal of Dental Science.*

PRACTICAL PLACE.

A Cement that Will Mend Almost Anything

Mix litharge and glycerine to the consistency of thick cream or fresh putty.

The article mended should not be used until the cement hardens, which will require from one day to one week, according to the quantity used.

The cement will resist the action of acids, and of hot or cold water, and almost any degree of heat. It may be used for stopping leaks, filling cracks or small holes in kettles or wash boilers, securing loose boxes in wagon hubs, mending stone jars, and a great many other breaks.—*Health and Home.*

Suggestions.

If the nickeled parts of the operating chairs, as well as the spitoon and bracket, be rubbed daily with a chamois skin, they will be kept bright.

Flowers on the bracket table, or in the office have a pleasing effect, and impress patients with the refined taste of the operator. These may be kept fresh for a fortnight by adding a little carbonate of soda to the water in the flower vase.

Broken tacks removed from the uplifted carpet are useful in cleansing bottles.

Lemons, so useful and agreeable as a refreshing beverage in Spring and Summer may be kept fresh for weeks if covered with water in a glass jar or any other receptacle.

Rubber, used for separating teeth, when grown hard or stiff, will recover its elasticity if put into a vessel containing weak ammonia water.

The fastest mechanism, artificial or natural, made to penetrate water for any considerable distance is, according to Mr. Jeremiah Head, Thornycroft's torpedo boat, Ariete, which, on trial, made 30.16 miles per hour. Aerial mechanisms are capable of very much greater speed, Canon Tristram told the biological section of the British Association, in his address, that Herr Gatke holds that godwits and plovers can do their 240 miles an hour, and the spine-tailed swift, according to Dr. Jerdon, can breakfast in Ceylon and sup in the Himalayas on the same day.—*Knowledge.*

A Summer Bath

Put to a cup of sea salt one-half ounce of camphor, and one-half ounce of ammonia in a quart bottle; fill the bottle with hot water, and let it stand twenty-four hours; then, when prepared to bathe with a sponge, put a teaspoonful of this mixture, well shaken, into your basin. A surprising quantity of dirt will come from the cleanest skin. The ammonia cleanses, and the camphor and sea-salt impart a beneficial effect which cannot be exaggerated.—*Ibid.*

Nitrate of Silver.

At the meeting of the American Dental Association for 1892, when the use of this article was under discussion, Prof. Taft said that forty years ago his attention had been called to it by Prof. James Taylor, of Cincinnati, and that he had been more or less familiar with it ever since. It was one of those excellent remedies which are allowed to fall into comparative forgetfulness, and after a term rediscovered. This assertion was rather hotly resented by Prof. Truman, who declared that he had been familiar with the literature of dentistry for more than forty years, and had no recollection of a single paper on Nitrate of Silver for the prevention of decay in teeth.

Dr. Kasson C. Gibson, of New York, has called our attention to an article written by the late Dr. B. T. Whitney, of Buffalo, published in *The Dental Register of the West*, then edited by Prof. James Taylor, in the number of April, 1854. In this article, Dr. Whitney, after giving a description of the agent and relating the results of a series of experiments in its use, conducted by him, goes on to say:

"As an application to decayed or denuded teeth that have become sensitive, I hold it in high estimation. It acts decidedly, and in a two-fold way, in destroying the animal fibres that, in their ramification through the body of the tooth, become exposed and inflamed, and then by closing the mouths of the cells with silver, which in parting from its corrosive power, unites with the oxygen and forms an inert metallic oxide. This gives a coating of insoluble metallic body over the denuded portion of the tooth, which, though exceedingly thin is yet sufficient to protect the nervous filaments and dentine from irritation and contact with the outer world. The tooth body, being porous, absorbs more or less of the nitrate, which soon oxydizes and gives the tooth a blackened appearance. These canals, though sufficient to transmit nutriment from the nerve pulp, through the dentine, are too minute to allow the introduction of the particles of nitrate of silver to a very great depth, so that the discoloration is superficial.

"That the oxide of silver closes the cells and forms a metallic surface, is perfectly demonstrable by immersing a tooth with the dentine exposed in a solution of the nitrate, and then placing it under a blowpipe, with a heat sufficient to fuse the silver, when a bright silver surface will appear to the naked eye, susceptible of bearing a polish with a burnisher almost equal to that deposited by the electro-galvanic battery upon a metal surface. * * * * In the softening of a tooth under a clasp, I have obtained decided benefit from its free use, in preventing the destruction of the lime, and forming over the surface a hard and impervious coating, the semi-disorganized portion of the tooth absorbing a greater quantity of silver, which in oxydizing becomes very hard. * * *

"Oft repeated applications will usually prevent pain, and in most cases, if not arrest, greatly retard the injury to teeth from clasps or denudation."

Dr. Whitney commences the article by saying that there has long been a popular prejudice in the profession against the use of nitrate of silver as a topical application to the teeth and mouth, thus proving that even then it was by no means a novelty in dental practice. In the next number of the same journal, that for July, 1854, Dr. George Watt, who had then but just graduated from the Ohio College of Dental Surgery, comments upon it, and attacks the chemistry of Dr. Whitney, himself making quite as apparent lapses. But he does not speak of it as a new remedy in dental practice. (In the same number, by the way, Chapin A. Harris speaks of the use of cobalt for destroying the sensibility of dentine, but says that it is the arsenic combined with it which devitalizes.)

In the *American Journal of Dental Science* for July, 1854, Dr. Whitney's article is copied in part, with seeming approval. (In the same number of this journal, Dr. C. A. Du Bouchet says concerning a matter that is not even now settled: "Capping nerves has never, so far as I can ascertain, proved an eminently successful operation.")

We submit that these extracts prove that forty years ago the use of nitrate of silver for obtunding purposes, and for the prevention of decay, was not by any means a new process, and that its modern use is but a revival of that which had fallen into disuse.

The Art of Thinking.

Did you ever notice how bunglingly some men think? There is as much difference in the way men use their mental faculties as there is in the way they use their tools. Just as one man will proceed deftly and systematically to the accomplishment of a piece of work with

everything conveniently at hand, every motion intelligently directed to the furtherance of the main purpose, and an expedient ready for every irregularity or difficulty which presents itself, so the ready thinker proceeds at once in a right line to the pith of a subject, sifting out the extraneous matter, defining the main point, and bringing to bear on it all his available information. On the other hand, a clumsy thinker will chase a question up one side and down the other, without getting anywhere or arriving at any relevant conclusion.

The mental, like the manual faculties, are susceptible and require cultivation. It is only by practice and continual use that the dexterity and skill of the expert machinist or other manipulator are acquired. However naturally ingenious and handy a man may be, he will lack deftness when placed on work to which he is entirely unaccustomed. To think with facility a man must be accustomed to thinking. It is one thing to let the mind roam about among the things one knows, and another to put it hard at work and keep it there grinding at something you do not know, but want to. It is easy and entertaining to read an article which tells you something which you knew before and which you can indorse, but you learn nothing by reading it. It requires an effort to read an article which contains real information, however plainly expressed. It has to be studied, applied, digested, criticised; the suggestions raised by its perusal have to be followed out to their conclusions; and to conscientiously read an article of this character is a task which a man is inclined to shirk just as a lazy man might shirk a physical task. But compare the man who shirks with the man who reads, and you will find in the first a mental bungler, in the second the acute and able thinker, the man whose head saves his hands and who is valued, respected, and trusted with the conduct of work and the administration of affairs, and rewarded accordingly. Always read a little ahead of yourself. Read matter which requires an effort on your part to understand. The effort will not only place you on a higher intellectual plain, but the mental exercise will develop a habit of accurate thinking which will be of more value to you than volumes of average matter read only to be forgotten.—*Items of Interest.*

Soap Bubbles.

L. A., Pennsylvania.—For the production of unusually large soap bubbles that will last for hours and exhibit splendidly the beautiful colors of the rainbow, a fluid may be employed which can easily be prepared in the following way: Fine shavings of palm soap are

shaken in a large bottle with distilled water until a concentrated solution of the soap is obtained; this is filtered through paper, and 1 part of glycerin added to each 3 parts of the solution. The fluid should be well shaken before using.

Another soap bubble solution may be made by dissolving 1 part of dry castile soap in 100 parts of warm water, filtering and adding 40 parts of white sugar to the filtrate. Bubles made with this liquid are said to last for hours.

Large soap bubbles may be blown by using a small glass funnel with a fine rubber tube attached for the "pipe."

Bubbles may be drawn into various shapes by attaching them to two wire rings which have been previously well treated to a coat of moist soap.

Pretty experiments may be made by attaching the pipe to a gas burner, the resulting bubbles being very light and inflammable.

Pyrozone for Bleaching Teeth.

Dr. Chas. B. Atkinson says that a twenty-five per cent. pyrozone, ethereal solution, is probably the best bleacher for teeth that has ever been offered. Its effects are exceedingly prompt and the results are permanent. The process is not attended with pain unless the gums be touched, when a severe pricking sensation is produced, and a coagulum seems to form in most cases; but this will return to a normal condition if not abraded. He also recommends it in treating abscess pockets and suppurating pyorrhœa alveolaris.—*Items.*

Simple Method of Curing Obesity.

In a French journal (Paris correspondence *Jour. Am. Med. Asso.*) is announced the discovery of a means, as simple as it is strange, for curing obesity, which is attributed to a medical officer in the army. Thanks to this means, a colonel who was threatened to be obliged to retire from the army, as he was so heavy that it required two men to lift him into the saddle, became thin in a few weeks, and to such an extent that he had to take means to recover, in a measure, what he had lost. It was to his doctor that he was indebted for becoming a general. The means consisted simply in never eating more than one dish at each meal, no matter what that dish may be, and a person may consume as much as the stomach can bear, and satisfy the appetite without the least reserve. Nevertheless, nothing but the one dish should be taken; no condiments, or soups, or supplementary desserts should be allowed. This system was recommended to a lady who

was slightly obese, and who put it into practice with the best results. The lady observed that she suffered no inconvenience whatever from this diet, and the result obtained by the medical officer may be well understood, as she found by her own experience that the partaking of only one dish, whether it be meat, fish or vegetables, brought on a sense of satiety much sooner than if she had partaken of a variety of dishes, whence the effect of relative abstinence.

Counting Dust Motes.

Who would think that science could devise an apparatus or instrument for counting the number of dust motes that dance in a bar of sunlight? No one would imagine that such an unheard feat could be carried out with any degree of accuracy, but, if we are to believe official reports, that and much more has recently been accomplished by the microscopists. At the Ben Nevis Observatory, Scotland, an attempt has been made to determine the relative purity of the atmosphere. The maximum number of dust particles in a cubic centimeter of air examined with a high grade microscope at the Ben Nevis Observatory has been found to be 12,862, from a "specimen" examined on March 30, 1891. The minimum is fifty-two particles to the cubic centimeter from an examination made on June 15, 1891. At one time a difference of some thousands of particles was noted within a few hours. Observations were taken at 12 M. and again at 6 P. M. The first showed but 26,785 particles, the last 12,682.

The Contraction of Rubber Plates.

The fact is well established that vulcanite contracts in cooling, and, in consequence, dental plates made up with section teeth almost invariably warp, and require more or less manipulation before a satisfactory fit is secured. In the case of upper plates, the change is quite apparent, the rear palatal portion being thrown up, causing the plate to rock. The arching up of this part of the plate is caused by the contraction of that portion immediately behind the teeth, the thin palatal part acting as a stay, and diminishing to some extent the amount of change experienced.

When, in repairing an upper plate, the entire portion is sawed out, it will be found that its heels will spring together, certainly as much as the amount removed by the saw cut, and sometimes even more. This shows that the same action takes place with lower plates, and to a greater extent than with upper ones. As they leave the vulcan-

izer full lower plates, with section teeth, are always sprung together at the heels, and are too narrow for the mouth. If they are re-vulcanized, they are thereby made still narrower, and are, thereafter, in many cases, not capable of being worn with comfort. *If they are heated sufficiently to soften the rubber and are then widened, the beneficial effect upon the fit will be quite apparent.*—Dr. Snow *in Practitioner and Advertiser.*

Phenosalyl.

De Christmas (*Annales de l'Institut Pasteur*) experimented with the bacteriacidal action of several antiseptic mixtures and found that the following merits preference on account of its solubility and antiseptic value :

℞	Ac. carbol	9 parts.
	Ac. salicyl	1 part.
	Ac. lactic	2 parts.
	Menthol	1-10 part.

Heat the three acids until they liquify and add the menthol.

The author calls this mixture "phenosalyl."

It is very soluble in glycerine and is soluble in water up to 4 per cent.

Its antiseptic action is thrice that of carbolic acid, and twice that of creoline, lysol or solveol. Corrosive sublimate only acts more strongly.—*Condensed Extracts.*

A New Lining for Vulcanite Plates.

Rubber dam as a lining for vulcanite plates cannot be surpassed. You proceed as usual with your case and when ready for packing, first pack round the pins and flange; then cut a piece of red rubber the shape and size of your cast, large enough to come up as high as you will require your case when finished. Then lay a new cream thin piece of rubber dam on this and cut out a piece to fit, remove and paint your red plate all over with good red or black rubber solder or cement on one side, being careful that it is all covered well with the cement. Now take the piece of dam and place it smoothly on the painted side of your plate; press well down; make it quite smooth, being sure there are no air bubbles. If your dam has stretched, which it will, trim the edges to the red plate. Place your plate in the flask so that your dam will come next your cast. When you close your flask, be sure and see that the plate comes well up round the flange so as to hug close to the model and not allow any red rub-

ber to be forced inside. Close your case by dry heat. Use paper vacums, and not tin as the dam will not harden over tin.

Rubber dam is better than gold for a lining as it is a non-conductor, prevents sore mouths and makes a very tough plate almost impossible to break; so you can make a thin light piece of work.—L. CROWTHER, D.D.S., Laurel, Md.

THE NEW MESMERISM.

A Paris correspondent of the London *Times*, who has been studying hypnotism as practiced by Dr. Charcot and his followers during the last decade, details some curious achievements of the hypnotic art. He insists, however, in the outset, that hypnotism of to-day, under all its aliases, is identical with the "mesmerism" or "animal magnetism" of former times. The marvels of the present are merely, he affirms, a fresh revival of the practices originally started in a systematic way by Mesmer over a hundred years ago, and subsequently brought into notice with improvements in 1820, and again about 1845. It was in 1845 that Braid, the Manchester surgeon, having learned the art of Mesmer from a professional mesmerist, gave it the name hypnotism. But nothing has been changed save the name. The hypnotism of to-day is the mesmerism of the last century, only with each successive revival of interest in it its strange manifestations are studied with the help of a fuller knowledge of physiology and pathology. None of the new feats of hypnotists are new in principle. The extraction of teeth under hypnotic anæsthesia and the treatment of dipsomania by "suggestion" are repetitions of experiments fifty years old. All that is new, perhaps, is the effort now being made to utilize hypnotism as a system of medical treatment.

The present method of producing the hypnotic state is to seat the patient in a comfortable arm-chair, with his back to the light, and direct him to gaze at a revolving mirror placed on a stand immediately in front of him, one foot from his face and rather above the level of his eyes. The mirror, of bright tin, about eight inches long, is revolved by means of a common clock-work arrangement in a box below, the revolutions being about 200 a minute. With each revolution the light flashes across the patient's eyes. The effect varies with the susceptibility of the patient. Some fall at once into an unconscious condition with eyes wide open, staring fixedly at the machine, the face expressing some vivid emotion. In other cases, after five, ten or twenty minutes, the hypnotist gently closes the patient's eyes and says, "Go to sleep." Some obey and some do not. Unless one is uncommonly self-willed he is lightly to be effected by the light

flashing into his eyes several times a second. The repeated stimulus of the optic nerve causes a distraction of the mind, which renders it impossible to concentrate the attention upon anything. The thinking faculty will not work. It lies inert and half bewildered ; control is lost. This being its condition when the hypnotist closes the eyelids and says firmly, " Go to sleep," the idea is seized with avidity as a means of relief, and is held tenaciously till unconsciousness is reached.

The mirror is not indispensable. It is enough to gaze steadily for a while at any bright object—a piece of metal or the hypnotist's eyes. Those mentally feeble folk who are open to every external influence, and find it easier to follow another's idea than originate one of their own, are usually hypnotized without difficulty. Some ultra hysterical organizations pass spontaneously into the hypnotic state, but these are rare. With those who have been frequently hypnotized only some very simple proceeding is necessary. It is enough for the operator to place his finger on the patient's forehead and say, " Look at me !" and afterward quietly closing his eyes, Just what the hypnotic state is no one can yet tell. It evidentally implies, however, a disordered train. Theorists in Paris speak of distinct varieties of this disorder as " lethargy," " catalepsy," " somnambulism," etc. Others say only " light sleep," " sleep, sleep," " very deep sleep," etc. Really these distinctions signify nothing, as the phenomena do not occur in a definite and orderly manner. But two hypnotic conditions are generally recognized, namely, sleep and somnambulism. It is the latter which supplies the marvels of heightened faculties and realized suggestions. The brain of the somnambulist becomes capable of a thousand things wholly impossible in its natural state. It is asserted by the *Times*' correspondent to be beyond question, that a plain woman, ordinarily dull and ignorant, will, when hypnotized, realize admirably a suggested character, and play the part with an utter truthfulness that surpasses the art of a most accomplished actress.

A new phenomena, apparently, is the transference of sensibility from a hypnotic subject to inanimate objects. The correspondent tells of a woman who, when hypnotized, felt pinches given to a gutta percha statuette, and felt them in such parts of her body as corresponded with those in which the gutta percha figure was pinched. This hysterical young woman was hypnotized in the usual way. The figure, about a foot long, was at first held in front of her, then it was placed out of her sight and pinched. Sometimes she felt the pinches and sometimes she did not. All the time the hypnotist had his hand

in contact with her. When he held the figure where she could see it she obviously felt the pinches given it very accutely. When the sole of the figure's foot was touched, she was tickled beyond endurance. In one experiment the figure was placed on a table out of sight both of the girl and the operator, while another gentleman put one hand on the operator's back and the other on the image. Whenever the second gentleman touched the figure the girl felt it. In another experiment she felt the pinching when the operator was some feet distant from her and the figure was out of sight. She always felt the pinches, but not always where they were inflicted on the mannikin. Such is one of the latest wonders of Parisian hypnotism.—*Baltimore Sun.*

Purification of Drinking Water.

Recent experiments conducted at the Pasteur Institute, in Paris, have shown that drinking water may be completely freed of cholera bacilli by the addition of fifteen grains of citric acid to a quart of water. As citric acid is an acid of lemon juice, it would appear that strong lemonade would answer the purpose equally well.—*Good Health.*

Choice of Occupation.

Every year in thousands of families, as the boys attain the age when they are supposed to have finished their school education, the important question arises: What shall be the future occupation of the boy? The question is not so easily answered, and whenever the choice of occupation has been made without full consideration, it is too often found that the selection has been made without reference to the physical and mental fitness of the boy for the chosen field. The wish of the boy is very seldom consulted, and though young yet and without mature experience, it seems but fair that his preferences should be taken into respectful consideration. Parents frequently make the mistake at this important juncture of choosing occupations for their boys for which the boys' physical system is ill adapted. Weakly boys with narrow chests should never be put at indoor occupations. Some trade that will keep them in the open air is better suited for such. Then, again, too many parents look upon all trades as something beneath them, and erroneously teach their boys that it is more respectable to enter one of the professions or even to go into clerking for a livelihood. All mechanical trades need to be recruited from the intelligent classes, and the condition of mechanics can only

be elevated when accessions to their ranks come from well educated, respectable, honest, self-respecting people. Too many boys are annually consigned to other occupations, for which they are not fitted, to the great damage of themselves and of society, and in which, after a long and one sided struggle for mere existence, which is getting year by year more and more precarious and difficult, they are finally left a stranded wreck, with the consciousness that the mistake in choosing their occupation has been the main cause of their misery and distress.

Most of this is due to the false pride and prejudice against a mechanical trade, which would have offered a good field for the wrecked boy by intelligence, industry, and perseverence to have become a man able to support himself and family and useful to society. Who can doubt the truth of this? If we look about us, we cannot fail to see that in all occupation the standards of requirements have been raised, and particularly in those employments which are not included in the mechanical branches much more is now expected from applicants for positions than formerly. Look at the increasing numbers of those who are studying for the law, the ministry, or the medical profession. Count the numbers of doctors, lawyers, and ministers who can barely eke out an existence. Scrutinize the advertising columns of any of our newspapers and see the overwhelming numbers of those who seek employment, having nothing to offer but willing hands and feet, ordinary intelligence, and very little education. Just look at the army of clerks and so-called bookkeepers constantly offering their services; indeed, it would be more truthful to say begging for employment at anything that offers. These are the direct consequences of an overcrowding in those employments which do not require knowledge of any mechanical trade. It is not so bad where these boys have parents with means who can help them, but when they have nothing but what they can earn, it would be well if our cry of alarm were heeded and false pride and prejudice were made to give way to the true interests of the boy.

On the other hand see how intelligent, well trained mechanics progress. It is not necessary here to cite examples of living men, who, after having thoroughly learned a mechanical trade. have by industry, economy, brains, and force of character lifted themselves into enviable positions of business success, honor, trust, and wealth. There are plenty who, from small beginnings, have attained success. All work is honorable and ennobling, and those who, probably being idlers themselves, profess to look upon the mechanic with disdain, and would, if they could, deny him equal rights, should remember

that idlers are always superfluous in this world's economy, but that the good mechanic is constantly in demand, as he is the one who lays the real foundation of all business success, and that his industry is an absolute necessity to the capitalists. If these people who turn up their noses at the mechanic allege as a reason for their exclusiveness that the mechanic is lacking in refinement, they should be told that it is partly due to the fact that those who deem themselves more refined have scrupulously withdrawn their refining influences from the mechanic by not associating with him. But the mechanic is not excluded from true culture, and one can find as many true gentlemen of culture and refinement among mechanics as among the so called professional classes, indeed often one searches in vain for refinement among the latter.

Much depends upon the quality of the material which enters the mechanical trades, and if many of those who now make the mistake of studying an unprofitable profession should learn a trade instead and determine to lead a refined life, it will not be long before even this somewhat imaginary reproach is taken away. It is not necessary either to go from one extreme to the other, and that all should rush into the trades, nor that the other great mistake be made of thinking that one mechanical trade is more honorable than another, and that every boy must pick out what seems to him to be a little more elevated a trade. We plead for the proper training of boys in the mechanical trades, for their thoroughly mastering the whole trade and not one branch of it. All mechanical trades offer a good livelihood, steady employment, and fortune for those who have the patience, perseverance, and industry to find it. Learn a trade! In this connection we may say that the question why boys do not properly and thoroughly learn a trade in these days has been partly answered by an old employer, who gives what, in his opinion, are the reasons. He says that boys nowadays are different from what they were when he was a boy. In those good old times they came to learn as much as possible, now to earn all the money they can. Then apprentices were the children of comparatively well-to-do people, who took pains to bring their children up properly and were more solicitous, by having their sons properly instructed and by making good mechanics of them, to make them independent of the world. Now apprentices come mostly from the poorer classes and are expected to bring as much wages home as possible, so as to help support the family. They only look for the immediate present, regardless of the future. The first question an apprentice asks is how much he is to get a week; he thinks only of his earning capacity and not of the time it takes to instruct him, nor

of the materials he spoils. The next question generally is, what hours he will have to work.

Then again in the olden time the master or foreman generally helped his instruction along by an occasional whipping, and many a good master workman to-day gratefully remembers the wholesome chastisement that made a man of him. Those days are passed, and Solomon's wise saying that he who spares the rod spoils the child is forgotten. The result is that employers now endeavor only to get as much work out of boys as they can, and take no interest in teaching them anything; in fact, boys in workshops nowadays are looked upon as so many necessary evils. When the employer ceases to be looked upon and respected as a teacher and educator, and only as an employer, there is an end of any hope for the proper instruction of boys in any mechanical trade. The labor and trade unions are much to be blamed for this state of things in their unwise attacks on the apprenticeship system. Times have changed, and with them old methods have passed away. We doubt very much if the newer methods are really an improvement. Time will tell.—*The Leather Manufacturer.*

Regulating Appliances.

A piece of suitable sized piano wire, bent and nicely fitted to the palatine or lingual surfaces of teeth, on a plaster model of either jaw, each end of the wire being bent outward at right angles, these ends secured by simply pressing gutta percha between the first and second or second and third molars, makes a very handy and easily constructed appliance for expanding either arch, causing little inconvenience to the wearer, and only takes a few minutes to construct.—*Dominion Dental Journal.*

Hint on the Insertion of the Hypodermic Needle

"Before introducing the syringe needle," says Dr. N. S Hoff, "it should be dipped into a strong solution of carbolic acid, then washed in a five per cent. solution of it, which should not be wiped off, for if a drop remains on the point when it touches the gum it will paralyze the tissue so that the needle will not hurt when inserted." These are excellent suggestions.

For an excellent varnish, procure a piece of clear amber, scrape or powder it, dissolve in Squibb's chloroform, which will take some time, add a little absolute alcohol to delay evaporation, and you have a varnish so hard that it will resist almost anything.—C. F. Ives, *Inter.*

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PINK RUBBER GUMS.

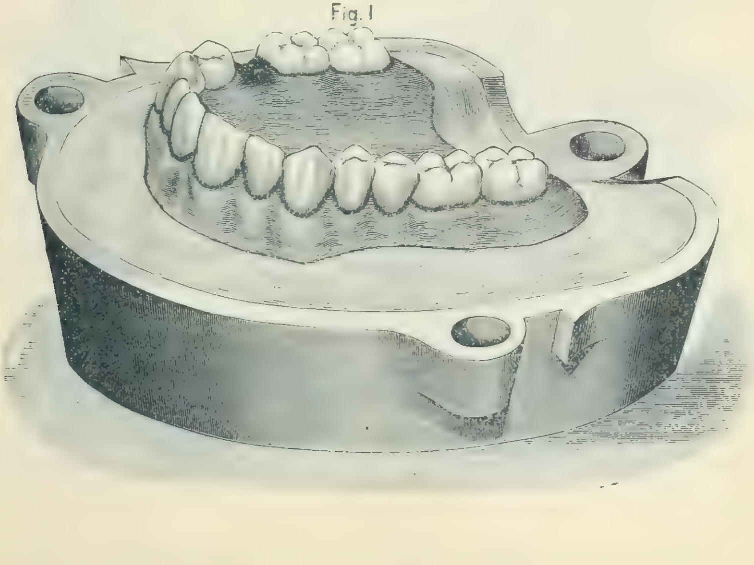
BY GRANT MITCHELL, D.D.S., CANTON, O

An experimental experience of several years has demonstrated that the most satisfactory results to be obtained from the use of pink rubber, are reached more through the manner of flasking and packing, than any of the purely theoretical ideas yet suggested.

It has been ascertained that "quality" is developed in as high a degree by vulcanizing at the usual temperature (320 F.) and ordinary period (one hour), as when vulcanizing has been prolonged, at more moderate degrees of heat.

It is unnecessary, then, for the dentist to devote attention to more than "artistic effect" in the matter of pink rubber. To obtain such object with but little more labor than is required in the ordinary process of packing, the case should be waxed, trimmed and smoothed, with as great care as if it were thus to go into the mouth. (As a

Fig. I



labor-saving device, this might be recommended to many, to be tried on other cases) A point is marked on the wax, on the median line, at a height to which the pink gum shall extend. Invest to this point, and, with spatula, manipulate the plaster while "setting," so that it leaves a smooth, straight line all around. See Fig. 1.

Pour the other side, being careful to avoid air bubbles. (The easy way to do this is to thoroughly soak the model before investing. The pores of the plaster model being thus filled, it will not extract the water from the investment, leaving it stiff and unyielding to the air pressure.)

After an hour the wax may be removed, and waste-gates cut. This is by no means an unimportant part of the proceeding. Waste-gates cut as they often are, by scoring the investment with a series of radiating lines are almost useless. And in connection with gum sections, occasions fracture more often than any other cause.

Rubber softens under heat. It does not become "fluid." Especially in closing a flask. It is necessary, therefore, to make provision for the escape of surplus in such a manner as will permit a *general spreading* of the softened mass. To do this cut a deep gutter in the lower half of the flask, from within a quarter of an inch of the model to the rim, extending entirely around the flask. Slightly bevel the portion of investment left standing, from the edge near the model to the "gutter" leaving a sharp edge of the plaster standing out toward the model. See sectional Fig. 2. (" I I", investment, " W W" waste

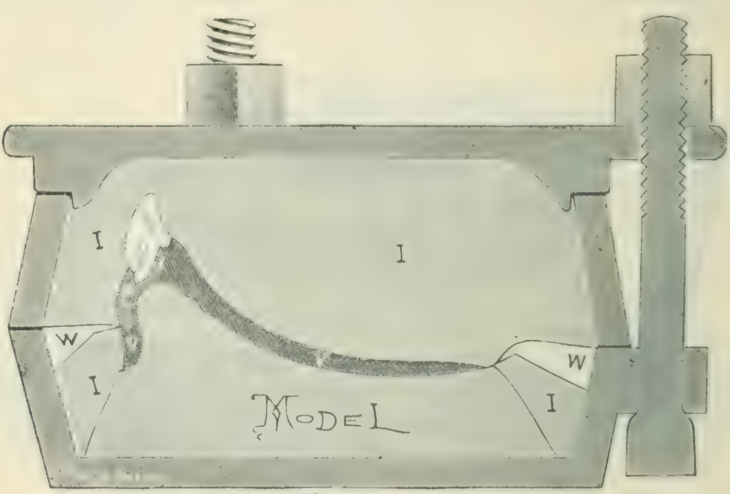


Fig. 2

gutter.) It is usually better, now, to let the case stand over night, or at least, for a few hours. to harden thoroughly.

Take the wax that has been removed from the case, attach it to the end of a packing instrument, and place it at the bottom of a tall, slender bar glass, nearly filled with water; tear off a tiny corner of paper and stick to the side of the glass at a level with the water. Remove the wax, and cut, first, two strips of pink rubber, three and one-half inches long, by five-sixteenths, and five eights, respectively, in width; drop these into the glass, then fill with other rubber until the water again reaches the mark indicated by the paper.

Have a stew-pan nearly filled with water, and covered with a piece of perforated tin, such as is used for strainers; take the 5/16 strip of pink, and cut fifteen to twenty small, triangular pieces, shown at Fig. 3, (C C C) and the balance of the strip, cut into small blocks

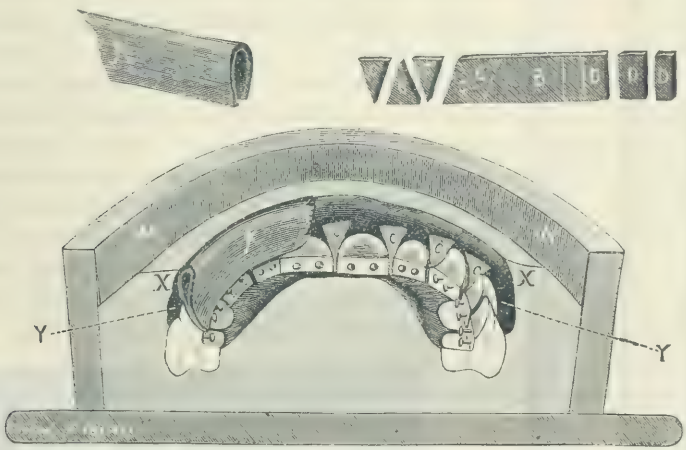


Fig. 3.

(D D D). Distribute these over the surface of the perforated tin, and place the whole on the gas stove and allow the water to come to a simmer. (Over heating causes the rubber to stick to the tin, and detracts from the "quality."

Many advocate warming the flask before packing. This is unimportant. The rubber being warm will pack well, however the flask may be.

Begin, now, with a triangular piece and pack between the centrals, carrying it down to the plaster level. Continue thus to fill between the teeth, back to the first molar on either side, building out to a

thickness sufficient to make the rubber nearly flush with the posterior side of the teeth.

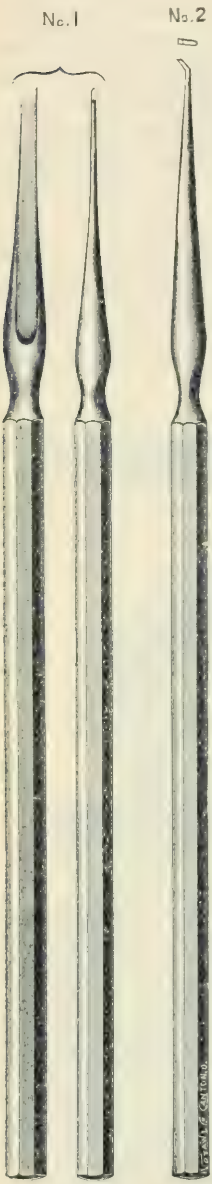


Fig. 5.

Next, take short strips of red rubber, wide enough to pack nicely under the pins, then with broader pieces, cover a portion of the palate.

The spaces marked " Y Y," Fig. 3, should be filled with the blocks " D D D." Take, now, the broad strip of pink, fold it over on itself (A, Fig. 3,) and lay around just over the pins, from molar to molar, allowing the fold to extend very slightly beyond the plaster edge (X X), press it in close with the fingers, and finish the side with red rubber.

The space between the model and investment, in the lower half of the flask, should be packed solidly with red rubber, and flush with the plaster edge.

Close the flask without displacing the pink fold "A". Exert pressure with the flask press so that it will be even on all sides. The surplus thus oozing out, will cut off the pink rubber on the edge of plaster so straight, that I have been often asked, when exhibiting a specimen of this work, whether it were not " cut out and vulcanized a second time." Fig. 4, is drawn from a set in practice, made as above described.


Fig. 4

Convenient packing instruments are made from the shanks of broken-excavators and pluggers illustrated in Fig. 5. No. 1 belonging to a set of two, right and left. These should be well tempered, and will be found most useful forms of chisels for all sorts of laboratory work.—*Ohio Dental Journal.*

UNNECESSARY PAIN IN DENTAL OPERATIONS.

BY JAMES A. REILLY, D. M. D.

It is not my intention this evening to attack any established theories or to attempt to overthrow any cherished opinions or prejudices. I simply desire to call your attention to a few points in everyday practice, and would prefer to suggest a few things you ought not to do rather than those you should do. Indeed, I am to address you from the standpoint of a patient in the chair rather than as the operator at its side.

One forenoon during my senior year at the Harvard Dental School, and while in charge of the dental department of the Bennet Street Dispensary, among the numerous patients was a lad of twelve or thirteen years He went through the usual preliminaries required in order to have an inferior bicuspid tooth extracted. The operator mechanically picked up his mirror and pliers to examine the tooth, or what remained of it, and almost simultaneously with their introduction into the boy's mouth there was a terrific scream and a plunge that almost carried him through the window. An attempt at extraction by a street dentist had resulted in the removal of the crown, leaving the entire coronal portion of the pulp standing unprotected. The dentist simply plunged his pliers into the mass of living tissue. Was not that an abuse utterly reprehensible on his part? I think it was, and so would you, I believe, had you been the sufferer. Yet we are doing just such things every day in one form or another.

That "familiarity breeds contempt" is nowhere more noticeable than in the use of dental instruments and appliances. Not long since, a gentleman somewhat prominent in dental organizations told me he had not a dozen excavators in his possession; that he excavated all his cavities with the aid of the dental engine, and wished to wager me that I could not find a cavity in a tooth that he could not reach and prepare as well, if not better, with the engine than it could be accomplished with hand excavators. Upon being questioned if his patients did not complain of being hurt, he replied, "Confound the patients! my duty is to protect myself." If this gentleman could but be patient and operator at the same time, I have no doubt that he would be easily induced to trade some of his burs for hand excavators. Has he not, to say the least, become too "familiar" with his engine? This I consider an extreme case of abuse, for, allowing for a moment that all cavities may be reached (which I do not believe, unless he destroys a vast quantity of sound tooth substance), the time that is gained by its use is but a trifling compensation for the

torture that is thus inflicted on children and excessively nervous adults, and I suppose he has such patients. He may run his engine slowly, use the sharpest burs and all the obtundants at his command, but does he diminish the loss of tooth structure thereby, or reduce the inherent antipathy to dental operations which the average patient has? Does he not absolutely destroy the last vestige of confidence the little one may possess who has been beguiled into the chair by its parent with the unqualified assurance that "it will not hurt a bit"?

Another appurtenance, no less barbarous in some of the details than the untimely use of the dental engine, is the rubber dam. A prominent writer says, if it is at all difficult to apply, the rubber dam should not be used in the cases of the very young, very sensitive, or very nervous patients. How many of us draw the line at these classes? It is not my intention to point out the occasions for its use or to urge upon you its abandonment, for I consider it a *sine qua non* to good results in numberless cases. But I would like to call your attention to the contempt for your patients' feelings that a "familiarity" with its application breed.

You are all aware how quickly you jerk your head away if by accident the floss slips too rapidly between your own teeth and burrows itself in your gums while you are cleansing them. How often the same thing is perpetrated on your patients, and nothing thought of it, by you at least, while you are laying coil after coil of cable on teeth that oftentimes do not require ligatures! Frequently, indeed, they serve only to obstruct access to the cavity. We all know, or should know, that with holes of proper size and shape in the dam the employment of ligatures is necessary only in a limited number of cases, provided the tartar has been removed from about the margins of the gum. But for pure, unalloyed torture, permit me to present to your consideration a clamp and an awkward or heavy handed operator, and I think there are a few such in the profession.

I speak from experience, for it once fell to my lot to sit in the chair with a clamp on an inferior wisdom tooth, compelling me to keep open house during the space of three and one-half hours. My knowledge now teaches me that it was entirely unnecessary, and that the cavity might have been filled, with the aid of napkins, in less time than it took to get the rubber and clamp adjusted, and with infinitely less pain and discomfort.

Now, I do not maintain that the clamp should be relegated into "innocuous disuetude," but I do say that extreme care should be exercised in selecting the proper ones to be used in each particular case, so that they may be easily adjusted, and that the most delicate

and extreme accuracy of manipulation possible be employed while placing them upon the teeth. I know of nothing more repellent to the average patient than the rubber dam and its accompaniments; therefore I think it behooves us to manifest a little compassion by dispensing with the use of the clamp, or the ligature, and even the dam itself, whenever it is practicable.

Another medium for pain-culture, and one which gives ample opportunity for the application of all the reserve abuse we may have stored away, is obtained during a course of regulating. A great deal of pain and soreness, of course, it is needless for me to say, is unavoidable while moving the teeth about, but there is also a large amount carelessly inflicted by over-anxious operators, too eager to accomplish in one day what should take a week, and again doing to day what they must undo to-morrow.

I once saw a case of regulating that was worthy of the attention of the society for the supression of cruelty to children. The teeth were very much displaced, and appliances were adjusted to almost all the teeth simultaneously. Too much force was applied, and too long an interval allowed to elapse before changing, so that when I saw the mouth there was scarcely a tooth in the superior maxilla that could not have been easily removed with the fingers. For articulation the patient could not bring the teeth together without suffering intense pain. And all this under the direction of a reputed skilful operator. The effect of such operations is most pernicious, for the impression they produce on the patient's mind is often more enduring than what they effect in the physiognomy, and frequently nothing short of an exposed pulp will permit further dental operations during those years when the closest scrutiny and care should be exercised.

This, then, is the point I wish to make regarding the lack of care to avoid pain during regulating; that oftentimes nothing is gained by the operation, because if you succeed in holding your young patient's interest to a successful termination of the work, you have also generated mentally such an intense dread and abhorrence of you and your benefactions that it is not until caries has obtained a firm foothold, and sometimes even demolished that which for months engaged all your energies to perfect and beautify, that your ministrations are again solicited. Would it not be more preferable to "make haste more slowly," and retain the confidence of the little ones, even at the cost of not accomplishing quite as much as you would wish to do at that time? This same principle is equally applicable to the filling of young teeth, and I frequently do nothing more at the first sitting than to cleanse a few teeth with the stick, or

wipe out a cavity with an antiseptic and insert a little gutta-percha or cement, sometimes without removing the decay whatever. For I consider my time well employed if I can succeed in dispelling this dread which always possesses them at the first sitting.

There are many minor things in our routine work that might be dilated upon in a paper of this kind which are really painful, although to us they seem very trifling, and if our patients shrink from them we are prone to ascribe it to fear or timidity, when we really are inflicting pain. By the habits of some dentists one would suppose the patient had no rights that the dentist should respect. He lolls over and leans on his patient, making of their head a cushion and support for his arm till the patient is well nigh exhausted. It does not diminish the discomfort any to know that it is sometimes done unconsciously. That much inconvenience and unnecessary pain are caused by our neglect to scrutinize our processes and individual peculiarities, or by failure to keep them before our eyes, is not to be denied. Is not unnecessary pain frequently caused while putting on gold caps, bridges, and collars for crowns, without first applying cocaine to the gum margin? Is it not unnecessary pain to continue nibbling at an exposed pulp that had not wholly succumbed to the arsenious paste? I think you will agree with me that to catch the lip beneath the thumb while making it a fulcrum against the teeth is rather painful, and that to wash out a cavity with cold instead of tepid water may produce avoidable pain.

How common an experience it is to hear an outcry, to see a twitching of the head and body immediately upon using the chip blower while excavating! It does not take place so much if we use warm air. Yet, do we always use it? Is it not positively abusive to whack away at a tooth for hours with the automatic mallet, when hand pluggers might be used with so much more comfort, at least during the first part of the filling? Is it not an abuse to inflict quick wedging as ordinarily performed? It is not an abuse in taking full impressions for artificial dentures, to overflow the plaster from your impression-cup into the throat of your patient, when a smaller quantity would produce a much better result by giving a more accurate impression, because the parts are not so likely to be disturbed by retching and coughing? Is it not abusive for a dentist having a strong, muscular hand, with a heavy touch and a vise like grip, to rush and hurry through his work as if he were under the impulse of electricity? My observations lead me to believe that rapid operators hurt more than slow ones I believe that after a fair rate of speed has been attained, any acceleration of it is obtained only at the

expense of delicacy of touch and of the patient's nervous system.

The conclusions I drew from my experience as a patient was that more pain and discomfort arose from outside influences, if I may so term them, than from the actual preparation of the tooth to be filled. It is within the ability of everybody to cultivate a delicacy of manipulation, if they do not naturally possess it, and delicate manipulation is a powerful factor in dispelling the dread so universal in the minds of the people relative to dentistry. As President Elliot said the other day at the meeting in behalf of Harvard's new dental school, "It is the dread of pain which makes people miserable."—*Dental Journal.*

OBITUARY.

Dr. Worthington Pinney Dead

The well known Newark Dentist Expires in Muzetskill, N. Y.

The news of the death of Dr. Worthington Pinney, a well-know dentist of this city, at Muzetskill, Renszelaer County, N. Y., has been received. Death was caused by paresiz. Dr. Pinney was born at Glen Falls in 1842. He studied dentistry in Albany, and came to this city in 1867. He was associated with Dr. De Camera until the latter went to Mexico, when Dr. Pinney continued the business alone. In 1884 he graduatad from the Baltimore College of Dental Surgery, and was a member of the alumni of that college. Dr. Pinney became a member of the New Jersey Dental Society in 1872, and was elected president of that body in 1886. He was one of the original incorporators of the Central Dental Association of Northern New Jersey, and served a term as president. He was also a member of the American Academy of Dental Surgery of New Jersey.

Early last summer Dr. Pinney's health began to fail and he went to Youngstown, Ohio, where he remained several months. The doctor subsequently went to the house of his uncle at Muzetskill, and remained there until his death. His body was interred at that place. Dr. Pinney was a single man and had no relatives in this city. His business will be continued by Dr. C. W. F. Holbrook, who bought out his practice.

Dr. Edward Williams

Died, at his residence, No. 52 Roger Avenue, Dec. 11th, 1893, of general tuberculosis, Dr. Edward Williams, aged 34.

Dr. Williams was born of Welsh parents, in Newtown, Montgomeryshire, Wales, June 13th, 1859. When quite young his father moved to America. He received his early education in the public

schools of North Adams, afterwards studying dentistry in the office brother, Dr. Thomas Williams, of Olneyville, R. I., where he also practiced for a time.

In 1882 he became associated with Edwin Frizzell, D.D.S., and opened an office in Lynn, Mass. On the death of Dr. Frizzell, he succeeded to the joint practice.

In 1888, he became associated for a short time in practice with M. C. Smith, D.D.S., M.D., but soon gave up the practice of dentistry altogether, on account of failing health. But, upon regaining his health, he could not seem to be content outside the practice of dentistry, for he soon opened another office in Lynn, where he continued to practice until his last illness.

In 1884 he married Annie E. Smith. He leaves a widow and two children to mourn the loss of a kind husband and a devoted father.

RUBBER PLATES.

BY T. F. SKEEDE, SEWARD, NEB.

Horace Greeley lived in the city of New York, and wrote a book entitled "What I Know About Farming." I live in the country, and will try to tell our city brethren what I know about rubber plates.

Being confined to a country practice, my patients are largely from the farming community, and cannot afford a continuous gum plate or the price of a bridge work. If we try to talk "continuous gum" or "bridge-work" to them for ten dollars a tooth, they hold up both hands in holy horror. With all due regard for the great and shining inventions, such as implantation, cutting off sound teeth for abutments for bridge-work, continuous gum at $75 a plate, etc., I know of no invention that has been of such benefit to suffering humanity as vulcanized rubber as a base of artificial teeth.

Professor Haskell will tell you that rubber plates will cause absorption of the alveola. Mr. President, "great men will differ," consequently I differ with Professor Haskell. I have here a cast showing absorption of the alveola, after wearing a temporary plate for eight years. I have also a cast showing absorption of the alveola after wearing no plate at all for fourteen years.

Some will tell you that rubber is poison, causing diseases of the gum, or so-called "rubber" sore mouth. Now, Mr. President, I do not believe there ever was a case of "rubber" sore mouth, and I challenge any one to bring me a case of "rubber" sore mouth that I cannot cure with a rubber plate.

The worst case I ever saw was under a small platinum plate that was put in the mouth in England, and had been worn four years without being removed. I removed the plate and found several very odoriferous substances, among them four roots, two of them ulcerated; also the liveliest case of "rubber" sore mouth that ever came under my notice.

A gentleman came to me one day with a very sore mouth. He had been wearing a small rubber plate, and his physician had told him that the mercury in the rubber had salivated. I cleaned his plate, which he was then wearing in his pocket, gave him a small bottle of listerin, and told him to put the plate in and wear it, cleaning it three times a day. He was all right in a week, has worn his rubber plate over three years, and has not been "salivated" since. It is not the rubber that makes the mouth sore, but the filth that is allowed to collect on and around it. A plate that is properly constructed is easily and quickly cleaned with a little water containing a few drops of ammonia.

The first thing in making a rubber plate is a perfect impression, which should be as perfect as it is possible to get it. This "good enough" will not do, for nothing is good enough which can be made better by a reasonable amount of time and perseverance, I use plaster, modeling compound, or a combination of both, whichever will best answer the purpose. No one thing is best in all cases. Then get a perfect articulation, for as much depends on the articulation as on the fit of the plate. After I get my articulation, I examine the mouth thoroughly for hard and soft places. I then scrape my impression on the median line from front to back, scraping deepest where the mouth is hardest, cutting away well in the front part of the palatine surface, as Professor Haskell would say, "to relieve pressure," but in reality making an air-chamber, and relieving the pressure at the same time. After pouring my model and separating, I scrape the model where the mouth is soft, deepest where the mouth is softest. I then cut a groove across the palatine arch, near the back edge of the plate, and continue it entirely around the model, near where the upper edge of my plate will come, thus making an additional air chamber of the whole plate. For my base plate I use common tea lead, using two or three thicknesses, as occasion requires, which, by the way, does not require more than half the thickness usually given to rubber plates, waxing where thickness is needed. After flasking and separating I remove all wax carefully, then usually cover both casts with very thin tin foil, but always cover the model. Next I soap well and pack, thus vulcanizing my rubber between metal, insuring a nearly finished

plate when it comes from the vulcanizer. I never boil my rubber p'ates

One of the greatest objections to rubber is that it shrinks in cooling, and creeps away from the teeth, leaving space for saliva, etc , to work in. If a plaster cast has been boiled in water at 320° for an hour, the plaster is so soft that it offers no resistance to the rubber. I use a tin blacking box cover, or something similar in the bottom of the vulcanizer, setting my flask on this, putting in but one or two teaspoonfuls of water. Nothing touches my flask but hot steam The plaster comes out hard, and the rubber firm against the teeth. A plate vulcanized between metal will have a harder surface than can be put on it in any other way. If cleaned semi-occasionally, it will never make the mouth sore, unless there is a misfit; and when the alveola has absorbed so the plate no longer fits, it is time to give some fellow a job of making a new one.—*Items of Interest.*

LOWER DENTURES, FULL AND PARTIAL.

If there is any one thing in the experience of the dentist that is especially annoying it is pertaining to the insertion of *lower teeth,* full or partial.

From the nature of things the patient cannot, as a rule, derive the satisfaction from their use that results from the use of the upper set. As I say to them in explanation of the subject, the upper set covers a large surface, and is held in place by atmospheric pressure, while the lower set in a large majority of cases, simply sets upon a narrow ridge, with no atmospheric pressure except in rare cases, and is easily moved by the action of the muscles.

In rare instances there is found a broad, high ridge; such cases are of course favorable, but my experience has been more with cases with no ridge at all, but flat and sometimes depressions. For some reason, not satisfactorily explained, there is more absorption in the lower jaw than in the upper. even where no plate has been worn, as is often seen in those cases where the bicupids and molars have been missing for many years.

Additional *weight* is an advantage in lower dentures. It is absolutely necessary that the plate should be sufficiently narrow not to be lifted by the muscles, and especially upon the lingual side, where often exists a membrane which lifts higher than the ridge. Upon the labial side the muscles, and even the membrane lifts almost to the margin of the ridge by the movement of the lips. I have had occasional cases where the outer margin of the plate had to roll upward instead of downward.

And yet with all these disadvantages it has seemed to me preferable to wear a full set rather than a partial. Although I have not advocated the extraction of the six anterior teeth, I have seen cases where I was sure the patient would have better success with the pressure distributed over the whole surface rather than upon the posterior alone. Then again the partial sets are always giving way under the pressure they receive, and as the plate settles, the portion of which passes behind the anterior teeth will crowd upon the membrane at the necks of the teeth. For this reason the plate should never be fitted just to the necks of the teeth as is often done, for then great harm results from the points pulling upon the membrane, causing injury to it and discomfort to the patient. These plates should be extended well upon the necks of the teeth. The plate will set the steadier for it.

Recently, however, in view of the annoyance so often arising from wearing full sets, I have been greatly impressed with the value of retaining even a single tooth if it be firm, or a root, in order to secure anchorage for a plate.

My attention has been especially directed to this in the use of the method of Dr. Stedman, of Laporte, Ind., which I am sure is proving a complete success, and great relief from a long felt need.

The method is: Instead of using an ordinary clasp of platinized gold, a band as wide as the full length of tooth, even though it does show, and extending around the tooth, or as far as adjoining tooth will admit, but always open made of 24 gauge gold without platinum. Solder a spur to the lingual surface to hold it to the rubber. Take the impression with the clasp *on the tooth* as this is the only method of securing the perfect adjustment of a clasp to a rubber plate. If only a root remains crown it, and fit a band to it as before described. If the tooth to be used as an anchorage is badly shaped, for a band to be fitted to, *crown* it first. I have had success with this method such as I never realized before.—HASKELL (L. P.), *Ohio Journal of Dental Science.*

NITRATE OF SILVER AS A THERAPEUTIC AGENT.

The following is the manner in which Dr. E. A. Stebbins, of Shelbourne Falls, Mass., recommends the application argenti nitras for the prevention of recurrence of decay as well as an account of a few cases and the results obtained:

MANNER OF APPLICATION.

Make, of hard wood, fine, slender points that will enter very small cavities.

Put these points into handles on different angles suitable to reach all portions of the teeth (two points, one on an acute and one on obtuse angle, will be sufficient.)

Pulverize the crystals (owing to impurities in the common lunar costic sticks, it is much preferable to use the crystals.)

The salts are dissolved in an equal amount of water, therefore there should be but little moisture in the cavity, or on the surface to be treated.

Moisten the wood-point a very little, so the powder will stick to it, and then take up on it an amount about the size of the head of a common pin, or more, according to the size of the cavity or surface, and apply to every part of the deceased portion. Apply enough salts and moisture to be sure the whole surface is touched. The salts will take effect in a minute or so.

Waste amalgam scraps rubbed over the treated surface or cavity, will take up the liberated nitric acid and turn the decay dark instantly. (Since writing this paper I have used silver filings.)

I have not sufficient data to determine whether the application of the amalgam is beneficial or not, but theoretically I think it is.

Silver instead of wood points may be used.

Of course the mouth of the patient should be protected during the operation.

Any slight touch to the tongue or other parts of the mouth will do no harm. I never heard a complaint of bad after-results. Some dislike the taste.

Use colored napkins so the stains will not show.

Do not allow the patient to wipe the mouth immediately with a handkerchief for fear of getting it stained.

After the salts have taken effect, and you are through with the treatment, at once inject a copious amount of water to carry away the surplus ; also allow the patient to rinse the mouth well.

The *manner* of protecting the patient's mouth from being touched with the salts can be determined readily by each operator. Caution and experience will enable any one to protect the patient's mouth and his own fingers.

SOME POINTS

Nitrate of silver forms with albumen and fibrin definite compounds, that are insoluble except with a few substances.

It is superficial in its action.

With the phosphates it forms nitrate of lime and phosphate of silver.

With the carbonates it forms carbonate of silver and nitrate of lime.

Superficial decay in labial and buccal surfaces show most favorable results.

Small cavities are more favorable than large ones.

If decay has reached the pulp it is not safe to apply the silver.

In my experiments thus far I have not removed any decay before applying the salts.

Where the gum has receded, and the exposed cementum is sensitive, the effect is very beneficial. In such cases it seems to stimulate the gum to more healthy action.

The liberated nitric acid should be removed.

When asked by patients what the treatment does, I often tell them it kills, embalms, and buries the microbes right in the place where it finds them.

The following patients will now be presented:

CASE I.—Girl. The little pits in buccal surfaces of second lower temporary molars were treated in March, 1886. The apex cavities in upper temporary molars treated in September, 1890. None of these cavities seem to have decayed since treatment.

CASE II.—Boy. The buccal surfaces of temporary molars were treated March, 1886, and have not decayed since. The apices in lower temporary molars were treated in June, 1887, and, having begun to decay again, were re-treated in November, 1889, since which time they seem to have kept quite well.

CASE III.—Girl. This patient had some cavities treated in 1888 and 1889, which you will observe are in a good state of preservation; while surfaces that appeared sound when the others were treated have large cavities now.

CASE IV.—Girl. This patient had several cavities treated in 1888. A year after nearly all traces of the silver had disappeared, and decay was active. They were then re-treated, and also some new cavities. Two years later all traces of the treatment had disappeared. Please observe that this girl is very nervous and of slight figure,—just the type of patients that often return to us for filling and re-filling.

CASE V.—Man. This patient had six small cavities treated in apex surfaces of lower incisors in January, 1886, and have not been touched since. Please observe that the characteristic results of the treatment are perfect, and the decay has been entirely arrested.

CASE VI.—Young lady. In 1888, when fourteen years old, she had nineteen cavities treated in the upper teeth,—most of them very large,—some adjoining fillings. Her health and nervous conditions

were such that she could not have fillings put in, and must have relief in some way or lose her teeth. Present condition: First molars decayed all away. Three cavities that were treated have since been filled. The remaining cavities have the characteristics of the treatment, and seem not to be decaying.—*Ohio Journal of Dental Science.*

[The late Professor T. L. Buckingham suggested a manner of making a delicate application of Nitrate of Silver. This was to take a piece of pure silver wire, bend it to suit the place where the application was to be made, dip the end of the wire in nitric acid and apply to the spot.—Ed.]

DEVELOPMENT OF THE HUMAN TOOTH.

BY DR. E. P. BEADLES.

Read before the Virginia State Dental Association, August 8, 1893

The histology of the teeth is too voluminous a subject for full treatment in a short paper, as this must necessarily be; hence, I have selected a small portion, viz.: The periods of calcification, the formation of dentine, and the formation of enamel. These will be treated on the surface merely. A few salient points will be brought out, which we can readily carry in our minds.

There is a wide field for prophylactic treatment in connection with the development of the teeth of the human race, which the future will demand of the dental profession to enter. It is well known that each succeeding generation brings with it more inferior teeth than was known in the preceding. We have in our chairs now children younger than ever before. Now, there must be a cause for this, and this cause it developes upon us to discover. Having found it, as an honest profession we will endeavor to remove it.

If I understand the object of these papers before your association, they are intended to put briefly and simply what the books tell us in detail about the subjects we discuss.

Dentine, as is universally admitted, is an offspring of connective tissue produced by the papilla, which is a formation of embryonal tissue crowded with medullary capsules. It begins to appear about the end of the second and beginning of the third month of intra-uterine life, at a time when the extremity of the epithilial cord has begun to flatten and assume a cup-shape. The cavity of this cup is filled with the papilla which sends prolongations along the outer wall of the cup, the future sack of the tooth.

At the beginning of the fifth month the odontoblasts are noticed. These are not direct dentine formers, but are provisional formations

from which arise medullary corpuscles, and these are changed into the basis-substance of the dentine. In a word, we see then that the dentine from the first is a formation of connective tissue, first visible in the shape of a knob-like protuberance termed the papilla. Second, the papilla is composed of medullary (or marrow-like, or tumor like) tissue, holding an irregular myxomatus net-work, originally scanty, but later on freely supplied with arteries, veins and capillaries. Third, shortly before the formation of dentine (in the fifth month of fœtal life) there appear at the periphery of the papilla elongated corpuscles, known as odontoblasts. From the odontoblasts are sent off the offshoots, which are dentine fibers. Fourth, the medullary corpuscles are transformed into basis-substance, which is the seat of the deposit of lime salts Next comes the development of the cementum, which I omit, except to say that it develops after birth, when the root and its dentine have been fully formed. At birth the crowns only of the temporary teeth are present, there being no trace of the roots.

The epithelial cord of the enamel organ is a formation of the epiblast. In the same manner as the nerve centers (brain and syinal cord) are products of the epiblast, greatly changing their character in the further course of development, the epithelial cord gives rise to the myxomatus tissue of the enamel organ. The epithelial cord arises from a furrow, lined with epithelium ; about the sixth week of intra-uterine life, and grows obliquely downward into the connective tissue, which latter produces the papilla about the third fœtal month.

After the formation of the enamel organ the epithelial cord is dissolved into clusters, which are partly transformed into fibrous connective tissue. The remnants of the external epithelium, as well as those of the epithelial cord, very probably furnish the material for the increase of the enamel after the original enamel organ has been exhausted.

The epithelial cord of the temporary tooth furnishes a lateral offshot for the formation of the permanent tooth. The papilla of the latter appear about the seventh month of intra-uterine life.

I now take up the periods of calcification, which are important.

After the temporary teeth are developed and have served their purpose they are then removed by resorption of their roots, and their places taken by the permanent set. A good deal has been said about the cause of this resorption and many opinions expressed. My own is that they are taken up by the same process that any foreign body is absorbed by the system and discarded. When the permanent tooth comes in contact with the end of the temporary root the nerve is severed, and the tooth becomes a foreign body, there being little

supply from the periosteum. When the permanent tooth fails to develop these teeth sometimes remain in the mouth for a number of years.

In the microscopical examination of dense animal structure, or such tissues as are made up of lime-salts, it is seen that they, like vegetable structures, have periods of growth and rest, which are illustrated by concentric layers or zonal shades, and that, while these conditions are normal, they are both intensified and modified by the genius presiding over the function of nutrition.

For the temporary teeth, we know that by the seventh week of intra-uterine life, and when the embryo is less than one and one-quarter inches in length, preparation is made for the development of the enamel germ, followed in the ninth week by the dentine germ. In the seventeenth week we find the border line between the enamel and dentine germs receiving depositions of the salts of lime. By the nineteenth week the same process has reached the molars, and from this period until the fortieth week, or time of birth, the growth of the tooth germs and their calcification progress simultaneously. At birth the calcification of the crowns of the eight incisors is quite complete; the four cuspids and four first molars are fully two thirds calcified; and the four temporary second molars have their crowns for half their length solidified by the same process. At the end of the following three months the infant enters into the critical period of its life, and from a glance at the condition of the twenty deciduous teeth and their progressive developmental change, it is reasonable indeed to assume that the conditions have not a little to do with the various abnormal systematic disturbances to which the child is subject at the time.

As early as the fifteenth week of embryonic life preparation is made for the development of the four first permanent molars, and following close upon these in the sixteenth week is the inflection giving rise to the enamel organ for the twenty anterior teeth, and from this period until birth the germs for twenty-four of the permanent teeth are passing through their several progressive stages preparatory to receiving the salts of lime. At birth, then, the child has not only the deciduous teeth largly advanced toward calcification, but has germs of twenty-four permanent teeth, in twelve of which calcification commences the first year. The germ of the second molar makes its appearance the third month, and that of the third molar the third year after birth.

The permanent teeth during the periods of calcification are very sensitive to morbid changes of the system, and any abnormal condi-

tion, even though of short duration, is almost sure to leave its mark upon the crowns of the teeth.

The four first permanent molars and the eight incisors receive during the first year a portion of their-lime-salts, and by the end of the third year twenty-four of the thirty-two teeth are in this process of development.

The fifth year the second permanent molars commence calcifying. The fact that the third molars are developed during the period of childhood and youth, when there is such a demand for all substances which go to make up the body, is one reason why these teeth are generally lacking in development; hence, they are often of little value.

It will be seen from the above how important it is for us to carry in our minds these periods of calcification, if we are to do anything in the way of prophylactic treatment.—*Southern Dental Journal.*

MEETINGS.

SECTION ONE.

Dear Doctor: The next meeting of the American Dental Association will be held Tuesday, August 7th, 1894, at Old Point Comfort, Va.

Will you prepare a paper for this section on Chemistry Crown Work, Orthodontia, Plates, Metallurgy, Obturators, Bridge Work, etc., etc.?

If there has been any new mechanical devices or novelties presented to your State or local Societies since August, 1892, will you furnish this section with them?

January, 1894. ALONZO BOICE, Secretary.

DENTAL MEETING of the New Jersey State Dental Society, at Asbury Park, July 18th, 19th and 20th, 1894.

BOOK NOTICES.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY, for 1893. B. H. Catching, D.D.S., Editor and Publisher, Atlanta, Ga.

It is wonderful how soon we become accustomed to things in the regular routine of life, and so have we become accustomed to the annual coming of Dr. Catching's valuable compendium, culled from the various English dental publications of the world. The doctor has excelled himself in the issue for 1893, now before us, which contains so many of the valuable articles which have appeared in the various journals of last year, dexterously "boiled down," "pared"

and "condensed," that it is a pleasure to look over its contents and mark out the many good things, which it takes but a few moments to read, when it would take many hours, even with a carefully prepared index to find what you wanted, much less to read and digest the kernel from the mass of verbage or outer covering, the article would doubtlessly have. Dr. Catching is to be praised, encouraged and well sustained in the work he has inaugurated and so well carried out, now in its fourth year. And when, in addition to what he *has* done, and promises to do in the future, by the employment of linguists to aid him in presenting valuable articles and suggestions from foreign journals, the work will be inestimable, for we will have in a book of 300 pages the "choicest flowers" gathered from thousands of papers. Let us then "pat him on the back" and say to him, "go ahead old boy, you are on the right track."—Ed.

Popular Essays Upon the Care of the Teeth and Mouth. By Victor C. Bell, A.B., D.D.S., Director of the Special Presthetic Department of the New York College of Dentistry; late Dental Surgeon to the German Polyclinic. Published by the author, 1894. Price, cloth, $1.25.

There is a certain class in every community who know and seem to desire to know nothing more of dentists or dentistry than the "extraction of teeth." To such, a work like the above would be of no use On the other hand there are many who are gratified and thankful to receive instruction of what can and should be done to preserve their teeth. Many times have we been told, when we have given advice how the tooth, which the patient has presented for extraction, might be saved, "that the other dentist did speak like that, but simply extracted the tooth indicated without offering any advice."

It is to these that a popular work like the above is fruitful of good results. And when the conscientious dentist is too busy to give this instruction, by referring patients and parents to such a work he can, through its instrumentality, do much towards engendering proper care, thought, and knowledge of the teeth and mouth.—Ed

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The Discovery of Modern Anæsthesia. By Whom Was it Made? A Brief Statement of Facts. By Dr. Laird W. Nevins, specialist in the Administration of Nitrous Oxide Gas for Minor Surgery and the painless extraction of Teeth. Cooper Institute, New York.

Dr. Nevins deserves credit for the book he has placed before the profession, and the brief yet pertinent facts he has presented towards

the settlement of the query—which we believe will never be definitely answered.

From the reading of the work, however, we are inclined to yield the palm to Dr. Crawford W. Long who, tramelled as he was by a country practice, isolated to a great extent from his professional brethren, living at the time when medical societies and medical periodicals were comparatively few, and not having the opportunities of testing it for Major Surgery—he was to a great extent hampered, and thus prevented from making known his discovery.

The work is well worth a place in every dental library, being "a tale well told," and not burdened by a useless sentence. It is accompanied by a chart with the portraits of Dr. Long, Dr Wells, Dr. Riggs, Dr. Martin, Dr. Jackson, Sir James T. Simpson, and Dr. G. O. Colton, as well as the monument raised to commemorate anæsthesia by ether, in the Public Garden in Boston, Mass. The work and the chart are published at $1 each, or both if taken together at $1.50—Ed.

THE PRACTICAL PLACE.

A Case in Practice.

A gentleman called upon me about two years ago, suffering from sore throat on the left side, neuralgic pains in ear and side of face and head. His physician had been unable to treat the trouble successfully, or even to diagnose the cause. I found, upon examination, that he was biting his cheek severely between his wisdom teeth. I removed the upper one and dismissed him. A few days since he returned to my office and reported having derived immediate relief after the operation.

This time he had come to have another tooth extracted, as he was biting his cheek opposite his first molars upon the same side. Upon examination I found a tumor, about as large as a good sized pea, upon the inside of the cheek, opposite the teeth mentioned. His teeth were sound but worn off flat. The outer edges were quite sharp. His cheeks were fleshy, and as soon as he opened his mouth the tumor passed in between the teeth, and lay in position to be bitten when his teeth came together. I ground off the sharp edges of the teeth, grasped the tumor with a pair of tongue forceps and drew it gently into the mouth, while my assistant held the cheek in position with a mouth mirror. The tension upon the tumor made it an easy matter to snip it off at its base with a pair of curved scissors. A jet of cold water thrown into the wound from an ordinary dental syringe, for a few minutes, stopped the slight bleeding which had taken place. The

patient left delighted that he had been relieved of his trouble without the loss of his grinder.—R. E. SPARKS, Kingston, Ont., in *Dominion Dental Journal.*

HERN (DR.) ON OBTAINING A CORRECT MODEL OF A PREPARED ROOT.

This device consists of a small copper shield about the diameter of the root, soldered to a guide pin. When the root is properly shaped and fully prepared take one of the shields or root trays and bend it to the angle of the root, and then put some softened gutta-percha on to the upper surface. This is then pressed on to the root and the gutta-percha forced up under the gum. An impression with the shield *in situ* is then taken with ordinary composition, and in this way an excellent model results.—*Brit. Journal.*

COCAINE dissolved in chloroform, one grain to one-eighth ounce of chloroform, is good to extirpate pulps without pain.

Take a small-sized sewing needle; at the distance of, say, three-quarters of an inch from the point, bend into the form of an S, the point of the needle forming the long leg, useful in filling labial cavities under the gum; stick the point into the neck of the tooth below the rubber dam, just above the edge of the cavity, lift the upper edge of dam over the eye end of the needle, and the resiliency of the rubber will keep the needle in place and the cavity dry. It is far ahead of any clamp for the above purpose. To prevent the eye of the needle penetrating the dam, put a little bead of shellac on the end.—*Dominion Dental Journal.*

CUT a piece of smooth soft wood, pine or white wood, eight or ten inches long by an inch broad, and quarter inch thick; give it a coat of glue, all over, except about three inches to be used as a handle; while wet fold a piece of emery paper all round the glued part; when dry you will have a handy strop to sharpen or touch up your chisels, excavators, etc. I keep half-a-dozen on hand, covered with different grades of emery. When the paper is worn out it is very little trouble to recover them. I find them exceedingly useful for polishing the dark stains on the handles of steel instruments, burnisher, etc.

ALL packings in vulcanizers will last much longer and give greater satisfaction if the cover is put on as soon as done vulcanizing and kept on till used again. Many packings are ruined by absolute carelessness or shall I say ignorance in screwing down the cover too

tight every time it is used. There is no occasion for this. After the vulcanizer is first newly packed it requires to be screwed down pretty tight. After this it can be put down nearly steam tight by the hands alone without the use of a wrench. I have often used one packing for two and three years, while a student, full of bull strength and ignorance, would destroy a new packing in one month. To use a long wrench, striking it with a hammer or stamping on it with the foot, as I have often seen done, is all wrong, besides injuring to the machine by spoiling the threads.—*Dominion Dental Journal.*

For removing a bit of gum overlapping a third molar, instead of cutting the gum away, it can be burned away with a little trichloracetic acid, without hemorrhage or subsequent soreness.—R. Ottolengui.

To Soften and Whiten the Hands.

Borate of soda	drams ij
Glycerine	drams iv
Lanolin	ounce j
Eucalyptol	dram j
Ess. of bitter almonds	m xx

Apply at night, and afterward dust the hands with Indian chestnut flour, and cover with gloves.—*Med. Press.*

The Goat a Protection Against Cholera.

The most popular place in New York, if the cholera comes, should be Shantytown, and the proudest animal on the island will be the goat. For Dr. Klemperer, of Berlin, after going over the subject of securing immunity against cholera, and after trying all methods of vaccination, including the swallowing of a pint of cholera bouillon, finds that the milk of an immunized goat does the work best and most easily. Subcutaneous injection of the milk from the goat artificially made immune was given to a man (who had volunteered). The injection of 5 c. c. of this milk produced such a degree of immunity that 0 25 c. c. of his blood serum protected a guinea-pig against cholera intoxication. There is hardly any doubt, says Klemperer, that goats may be made more resistant by further injection, and thus their milk will have greater antitoxic properties. The author thinks it permissible to hope that the injection of 1 c. c. of such goat milk will protect men not only against the intoxication of cholera, but also against the infection. The price of goats has been five dollars

and upward. When cholera comes this much ridiculed animal may take a position in history higher than the sacred bull of Egypt or the vaccinated calf of Jenner. Harlem, too, will become the centre of New York, and not an uptown annex.—*Medical Record.*

Gutta-Percha as a Root Canal Filling.

After thoroughly treating and drying the root-canal, take a Dunn's syringe with a platina point, and inject a drop or two of saturated solution of hydronaphthol and chloroform in the root canal. Then take a gutta-percha cone, place it in the canal as near the apex as possible, where it dissolves; in other words make the chloro percha in the root, then follow this with one cone after another until the canal is entirely filled. If any "chloro-percha" passes through the apex of the root, it no doubt becomes encysted. I have never had any trouble arising therefrom, and I am positive that I have passed some through the apex, because the patients have noticed it by describing to me a slight stinging sensation, which quickly subsides, and no future trouble arises. I have employed this method for a number of years, first using iodoform and chloroform instead of hydronaphthol and chloroform. I find this method simple, clean, antiseptic, and effective.—S. Freeman, in *International.*

Bodecker (C. F. W.) on the Herbst Method of Treating Pulps.

The methods of practice observed by Dr. Herbst are as follows: If the pulp of a tooth is in such a condition that it becomes necessary to move it, an application of cobalt to which has been added about eight per cent. of hydrochlorate of cocaine is made to it, and covered with wax or some other temporary filling material. After two or three days the temporary filling is removed, the cavity cleansed from all decay, and rinsed out with water. Then, if practicable, the rubber dam is adjusted, the cavity thoroughly disinfected, and the coronal portion of the pulp is amputated by means of a large, perfect, clean, sharp, round bur, which is rapidly revolved in the hand-piece of the dental engine. The bur must be nearly as large as the coronal portion of the pulp which is to be amputated, The pulp-chamber is then to be washed out with a solution of corrosive sublimate, of the strength of one-tenth of one per cent., and dried. A cylinder, or a loosely-rolled ball of No. 4 tin foil, as large as the cavity will admit, is now placed in the pulp chamber, directly over the amputated pulp-stump, and with a revolving, smooth burnisher, which is smaller than the pulp chamber, the tin is burnished firmly into it. In burnishing,

care should be exercised not to press the tin directly upon the pulp-stump, but the force should be exerted more laterally. It is also necessary that the stumps to be capped in this manner be not irritated with small burs, excavators, or nerve-instruments, as failure has been observed in those cases in which this was done. Dr. Herbst also advises that in case the tooth becomes sensitive to pressure after such an operation, it should be shortened a little, and the filling in the tooth not left high enough to touch the antagonizing tooth. If amalgam is employed, it is advisable to place a small particle of wax upon the tin cap, and distribute it over the surface of the tin by means of the rotating burnisher. If this precaution is neglected, the mercury of the amalgam will combine with the tin, and the efficiency of the cap be destroyed. The theory entertained by Dr. Herbst in regard to this treatment of pulps is, that by burnishing tin or gold into the pulp-cavity, he creates an absolutely air-tight covering to the root-canal, which is not obtainable with other materials. Dr. Herbst claims that good results cannot be expected by the use of amalgam, cement or gutta percha, and even tin and gold foils introduced into the pulp-chamber by the mallet system have proved to be failures. In cases of front teeth, he employs gold foil instead of tin, —as he claims, with equally good results.—*The Ohio Dental Journal.*

Drilling Cavities in Artificial Teeth.

Dr. E. T. Davis, of Bridgeton, N. J., writes us upon this subject as follows: "Many of us, not being convenient to the dental depots, should be able to prepare the cavities ourselves. I find this can be done very nicely by using an inverted cone or wheel drill (on the engine), which must be kept wet with spirits of turpentine. In this way the cavity, under-cuts, and retaining pits can be made without any trouble."

While this, in the hands of some, may give good results, the ordinary diamond stone and drill will give more universal satisfaction.

Dennis (G. J.) on Making and Using Matrices.

To be properly used, matrices should be made of some tough, flexible and elastic material and as thin as possible. When placed in position they should conform themselves approximately to the shape of the teeth as they existed originally; they should be capable of being held firmly in position in such a manner that there can be no slipping or moving from the beginning to the end of the operation; they must be springy, and yield slightly to lateral pressure, as the

gold or other material is impacted against them. It is self-evident that they should be wide enough to extend beyond the cervical borders, and in most cases should extend beyond the morsal surfaces. The surfaces looking into the cavity should be well polished to act as reflectors, and to give a finished surface to the filling. Polished surfaces also permit ready removal at the close of the operation. If matrices possess these qualities, and are then placed in position without pressure upon the enamel margins, and are held in position tightly enough to prevent slipping, and yet held sufficiently to allow the filling material to be forced slightly between them and the margins of the cavities; if the enamel margins are prepared according to the principles announced by Dr. Black, the matrices will prove invaluable assistants, and he who uses them will find an economy of time, labor and of nervous energy which will certainly be appreciated.

On the other hand, if matrices are made of an inflexible, unyielding metal and unpolished; if they are held tightly in position with their surfaces in close contact with the borders of the cavity; or so loosely that they slip and slide from their original position; if the enamel margins are either extensively beveled, or thin edges of enamel are permitted to remain; if no consideration of tooth form has entered into the shaping of matrices; or if the filling material is not well impacted against the tooth and against the walls of matrices; if the sides of the filling have not been carried up a little higher than the centre as the operation has progressed, then failure in the use of matrices will be the inevitable result, and these instruments will be condemned when it has been the operator who has been at fault.

These instruments must be used carefully and skillfully, and each case must be studied with regard to the conditions present. If this is done matrices will receive the approval of all dentists, and the results will justify their more extensive application.—*Review.*

DURING each twenty-four hours there is extracted from their respective glands an average of two pounds of saliva, ten pounds of gastric juice, five ounces of pancreatic juice, two pounds of bile, besides a large quantity of other fluids, at least twenty pounds daily in all; there is as much excreted as secreted.—*Dominion Dental Journal.*

REEVE, (N.) ON A METHOD OF OBTAINING EVEN PLATES.

The ordinary way of bending up wax by warming and pressing it on to the model with the thumb is open to objection that the thumb being harder and more unyielding than the soft wax tends to press it

very thin over the argæ, and not at all into the interstices of the teeth. This may be avoided and the rugæ brought prominently and evenly on the surface, by heating some modelling composition in water, rendering the wax pliable by dipping it for an instant in the water with the composition, then placing the wax roughly in position on the model and with the soft composition knead it well down into place; on parting the composition from the wax, the latter will be found to represent on the surface almost a duplicate of the surface of the model.

The composition has of course a tendency to stick to the wax, if too hot. Should this give trouble, dry the composition first, and smear the surface of it with a little French chalk. In subsequently setting up the teeth and preparing for the flask, care should be taken that the surface of the wax is not cut or scratched; when finally ready for the flask the surface of the wax should be polished by lightly rubbing it with the finger tip or cotton wool.—*Extract Brit. Jour.*

Shields (N. T.) on a Method of Painless Devitalization of Tooth Pulp.

When it is necessary to destroy the pulp, instead of making an application directly upon the pulp itself, I apply the arsenious acid indirectly. Make the application of arsenious acid upon a spot of freshly exposed tooth-structure, and hermetically seal with gutta-percha, make an application of cocaine to the part of the tooth where the exposure is, and the patient will leave the office perfectly comfortable, and the pulp will die without the patient being conscious that the thing is being done. Leave the application one week, and at the expiration of that time you are able to take a sharp bur and go further into the dentine, almost to the pulp itself, without one particle of pain; then make a fresh application of arsenious acid, and hermetically seal it up with gutta-percha, and leave it for another week and the pulp will be perfectly dead, without the slightest inconvenience to the patient, save about the tenth day it will be abnormally sensitive to heat and cold. If the patient takes hot water or hot coffee, and it creates tooth-ache the way to avoid it is not to allow the hot coffee to touch the tooth. Tell the patient to look for this sensitiveness two or three days after the second application. At the first symptoms of sensitiveness the patient will avoid hot drinks; and if he does take hot soup or hot coffee, the tooth ache as brought about can be readily relieved by the application of cold water.

By applying the arsenious acid in this way not a particle of it

comes in contact with the pulp itself, and hence there is no soreness caused at the end of the root by the acid being absorbed through the foramen. At the expiration of the second week the tooth is ready for the operation of removing the pulp and filling. I always open these teeth with large burs.—*Extract Cosmos.*

Farmer Cobbs—" How much for pullin' a tooth?" Dentist—"Half a dollar if you take gas." Farmer Cobbs—" Gee, whizz! Why, I read in the papers that gas only costs one dollar a thousand foot, and if you was to fill me up from tip to toe, 'twould not take more than six foot. Not to-day, you don't, doctor."

How to Stop Palpitations.

Take spirits of camphor on a napkin and inhale it well into the lungs. It gives instantaneous relief, and is also an excellent remedy for colds, both in the head or lungs.—A. D. Barsett, Norfolk, Va.

In finishing a gold filling you can prevent the plug finishing bur from clogging up with the metal by dipping into a little sweet oil. It also makes it cut better.—W. M. Jennings, Cleveland, O. *Ohio Dental Journal.*

Obtunding Sensitive Dentine.

After applying the rubber dam, fill the cavity with solution No. 1, slightly warmed. Follow this by a continuous blast of warm air till the contents of the tubuli are thoroughly extracted. Then apply solution No. 2 direct to the cavity in liquid form. Force on this a warm vapor from a suitable glass cylindered hot-air syringe. When cavity is dry excavate with a small, sharp bur with light and rapid motion, always cutting from the pulp.

Solution No. 1.

Absolute alcohol	1 oz.
Veratria	8 grs.

Solution No. 2.

Oil cassia	50 parts.
Absolute alcohol	40 parts.
Campho phenique	5 parts.
Carcolic acid	3 parts.
Oil cloves	2 parts.

Wash the cavity before removing the dam.

Fred Adolph Kotts, Manchester, Mich.

Freeman (R.R.) on Lower Plates

A plate may be ever so well constructed so far as adaptation and occlusion are concerned, if it does not extend well back and up along the ramus it is liable to wabble in the mouth. It is not always necessary for there to be a well defined ridge to have a lower plate rest firmly in position. In addition to the plate extending well back, I will give you a little device which was suggested to my mind by Dr. T. E. Busch, of Franklin, Tenn. It is this: After you have waxed up, as you would ordinarily, ready for flasking, extend around the external border a well-defined ridge, say within $\frac{1}{2}$ of an inch of the gum margin; this can the more readily be done by the use of a small piece of wrapping twine which has been saturated in wax. With a slight puff of the blow-pipe flame it will adhere just where you want it, and when reproduced on your plate, will afford a line on which the lip will take hold, and in many cases causes it to adhere with considerable tenacity to the jaw.—*Southern Journal.*

Pulp Devitalization.

White oxide of zinc ... .$\frac{7}{8}$
Chrystals hydrochlorate cocaine..................$\frac{1}{8}$
Creosote, q. s. to make a paste.

After removal, apply tannin dissolved in glycerin or alcohol. There will be no trouble in removing pulp whole, without pain.—Dr. I. B. Crissman.

To Sterilize Softened Dentine Left Over Nearly Exposed Pulp.

Dry thoroughly and apply: Carbolic acid 1, oil of cassia 2, and oil of cloves 3 parts. Insert permanent filling at once.—Dr. H. A. Smith.

Coffee and Tea.

Experiments confirm the view generally expressed by physicians, that coffee long boiled prejudices digestion, while a simple infusion facilitates it; but its beneficial action in the latter case is now shown to be due, not to direct chemical action on the albumen present, but indirectly to its action on the nerves of the stomach, promoting the secretion of gastric juice. In other words, its action is physiological, not chemical.

Turning now to tea, he finds its constituents very nearly similar. The tea leaves also contain caffein (called also theine), aromatic sub-

stances, and tannin. Consequently in tea, as in coffee, the properties of the beverage depend very much on whether it is an infusion or a decoction.

The problem is very simple. The traveler on the march will find himself benefited most by the caffein, and to secure this the coffee must be brought to, and maintained for a few minutes at, the boiling-point. But to take boiled coffee after a full meal impedes digestion and heightens the heart's action unduly. On the other hand, an infusion of tea or coffee, taken at such times, facilitates digestion and exerts a wholesome and exhilarating action on the nervous system. Long boiling, or stewing near the boil, of either tea or coffee, brings out all the tannin, which is always prejudicial to digestion. As a consequence the practice of keeping tea or coffee hot, upon the stove, is a pernicious one.—*The Gartenlaube, Leipzig.*

WHEN a glass stopper sticks in the bottle, pass a strip of woolen cloth round the neck of the vessel and seesaw it backward and forward. This friction heats and causes the neck to expand, so that the stopper becomes loose. On this principle of expansion by heat a tight screw may be withdrawn from a metal socket by surrounding the socket with a cloth dipped in boiling water.

TO ARREST A COLD.

Tincture gelsemium ....gtt. 2
Liquid ergot.. " 5
Camphor water........ ....dr. 4

Mix, and take every hour immediately the cold is felt. If this is taken for twelve hours, at the same time keeping indoors in the warmth, many a cold will be cut short.—*Corr.-Bl. Schweiz. Aerlze.*

HOW TO GROW STRONG.

All men and women, unless they are afflicted with some organic disease, can be strong and healthy, if they will. That desirable result can be obtained if they simply follow the rules of action their ancestors were governed by. To accomplish this some self-denial is required. The majority of men and women are self-indulgent. They eat, drink and sleep too much. More people die nowadays from overeating than undereating. I am not a cynic and do not believe in banting, semi-starvation or any of the drastic methods which some physicians advocate to reduce one's avoirdupois and to gain strength after it has been depleted by an excess of adipose tissue.

Strength cannot be regained in that way. Such a process only weakens the seeker of health, just the same as "tapping" does a dropsical patient.

Neither will "stuffing" aid a man or woman, who from natural or artificial causes, suffers from a wasting of the tissues.

There is only one curative remedy for both, and that is exercise. By that I do not mean that people should overtax their physical energies to attain health and strength. On the contrary, I insist that the process shall be gradual. The lighter the exercise to begin with the better. Increase the amount as your strength increases. Never through pride or any other reason strive to do that which you cannot, without extreme effort, perform. A man or woman should always feel better and stronger, not weaker, after taking exercise, outdoor or indoor.

Exercise. judiciously taken, I believe to be the panacea of all evils. It stimulates all the vital functions, heart, lungs, liver and kidneys. It also strengthens all of the muscles of the body and indirectly aids these organs.

If any man primarily sound physically, will follow the systematic course of training that I have pursued I will guarantee that he will become stronger and healthier than his fellows. Even those with acquired or inherited diseases will be bettered by the essay.

The rules are simple and easy to follow. Fat men and women should avoid—or rather decrease by degrees—ales, porters, liquors, starchy cereals or fattening substances of any kind. Lean people should partake of these in moderation. Both can partake of juicy joints, be they from the sheep or from the ox, only let them avoid too much seasoning in the way of salt, pepper or sauces. These create an unnatural thirst which nothing but copious draughts of liquid of some kind can quench. Too much liquid overworks the kidneys and liver, and indirectly affects the heart.

Observe these primary injunctions and then be guided by the following rules, and I will stake my reputation that you will become strong and healthy inside of a year :—

Never sleep more than eight hours a day. Eat regularly and at stated intervals in the manner already prescribed. Walk a mile or more after each meal before attempting any labor, physical or mental. A jaunt of two, three or five miles in the afternoon, when nature is at her best, will not harm you a particle. You are to be governed entirely by your powers, and nature will tell you when we have had enough. Then go to a gymnasium and exercise with light dumbells

for an hour or two every day, with frequent intermissions for rest. Try every kind of motion, backwards, forwards, overhand and underhand. Any athletic professor can teach you all the curves. In this way you will develope the muscles of every portion of the body and surprise yourself at the end of a twelvemonth by the improvement in your condition. Of course, a quick bath—a shower is the best—and a vigorous rub-down should be taken after exercise. In this way you can attain health and strength.—EUGENE SANDOW.

CAPPING FOR EXPOSED PULP.

If a tooth with a deep seated cavity aches, it is a pretty sure evidence that the pulp is partly exposed, but not that the tooth should be abandoned to the forceps. Place in it a little tannin made into a paste with equal parts of oil of cloves and creosote, and then fill with oxyphosphate. Generally the condition of the pulp will be normal. In a month cut out a small portion of the filling and plate with metal. —*Items*.

GOODELL (H. W.) ON TAKING PAINS IN MAKING PLATES.

We cannot be too careful with our plate work; many a case is ruined in polishing, by overheating and springing. Many times before the plate is removed from the flask it is imperfect, on account of not giving the investment time to thoroughly harden before attempting to pack the case. Then again by filling the flask too full of rubber and attempting to close it.

Plaster should have at least four hours to harden before it is put under screw pressurs.—*Items.*

GERMAN engravers harden their tools, says the *British Mechanic*, by heating them to a white heat and then plunging them into sealing-wax, continuing the operation until the tool is cool. By this method the steel becomes almost as hard as a diamond, and, when touched with a little oil, is excellent for engraving or for drilling into other metals.—*British Journal of Dental Science.*

MITCHELL (L. J.) ON A RELIABLE COCAINE SOLUTION.

As far as I can see, the best results have been by the combination of hydrochlorate of cocaine—3 parts, and 2 parts hydrate of chloral—a ten per cent. solution for an injection, to which I add about a drop of oil of cinnamon.—*Review.*

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DRAWING A TOOTH PARTLY OUT OF ITS SOCKET IN ORDER TO CORRECT A DEFORMITY.

By Theodore F. Chupein, D.D.S., Philadelphia, Pa.

Miss M. M— had the misfortune, while mailing a letter at a lamp-post postal box, to slip, and falling on the curb she struck her teeth so violently as to cause a fracture, such as is illustrated in Fig. 1. The teeth were fractured but not devitalized by the blow. This happened when she was a child, but in after years, when she had attained her twenty-fourth year, she applied to us to see if anything could be done to correct the deformity caused by the accident.

We propose to record our mode of procedure from the time we took the case in charge. The teeth were very close together, and as she had lost none of them they were difficult to press apart sufficient to gain room to make the caps by which we intended to cover the teeth to make the appliance. With some difficulty we were able to insert *one thickness* of rubber dam between the teeth that were to be capped, but by changing this daily for four or five days we were enabled to get as many as six thicknesses of medium rubber dam between them.

Fig. 1.

The *left central incisor* was now cut off at its distal cutting edge, so as to restore this tooth, as much as possible, to its normal shape, and the right central incisor was also dressed down at its distal cutting edge, as also some of the cutting edge of the right lateral incisor, the better to fit the caps, which we shall describe later on.

The teeth separated and cut as described, we next took an impression of the teeth with plaster of Paris, and into this impression, after luting the ends to prevent the escape of the melted alloy, we poured enough of our *crown metal* to make a perfect die.

On this die we shaped a cap that entirely covered the right central incisor. To this cap, at its cutting edge, we soldered a screw as shown by Fig. 2.

This cap made, we simply fitted pieces over the left central and right lateral incisors very accurately, and on the part which passed over the cutting edges of these teeth we soldered four or five thicknesses of plate 26 gauge. This being shown by Fig 3.

On these pieces, which raised the cutting edges of left central and right lateral incisors, we soldered the yoke shown at Fig. 4., which was made of two pieces of plate 24 gauge, soldered together. To permit the screw of the cap (Fig. 2) to pass through the yoke (Fig. 4) a hole was drilled in the yoke. The end of the screw was fitted with a nut. The device thus made is shown by Fig. 5.

Fig 2.

Fig. 3.

Fig 4.

Fig. 5.

To apply the device, five teeth were covered with *thin rubber dam;* namely, the right cuspid, the right and left lateral, and the right and left central incisors. These teeth were then thoroughly wiped of all saliva or other secretions of the mouth, with bibulous paper. After this, chloroform was used on small pieces of cotton on all surfaces of the teeth that were to be capped, to remove any greasy deposit that may have adhered to them. Finally, a weak solution of hydrochloric-acid and water (one drop of the acid to ten of water) and with this the enamel of the teeth that were to be capped were slightly roughened. This was then wiped perfectly dry, and the cap Fig. 2 was applied. We applied this by mixing oxyphosphate of zinc cement, moderately thick, and smearing this over the interior of the cap as well as over all surfaces of the tooth, and then carrying it to its place on the tooth, holding it firmly until the cement got moderately hard. As much of the cement as oozed from the cap was then removed before the remainder set hard.

The yoke, which had been soldered to the two caps over the left central and right lateral, Fig. 5, was now applied in the same way as the other cap, carefully passing the screw of Fig. 2 through the hole in the yoke, and holding this in place until the cement hardened moderately. The appliance was then permitted to remain on the teeth for 30 to 35 minutes or until the cement which had been mixed on the slab showed that it was *perfectly hard.*

The nut was then applied to the screw, but not tightened, and so much of the screw as extended beyond the nut was nipped off with the cutting nippers, and then made smooth.

The appliance as attached to the teeth is illustrated at Fig. 8.

To make a cap such as is represented by Fig. 2 requires delicate manipulation. We first made a pattern of pattern metal. Such metal as is used to cover the corks and necks of wine or whisky bottles will be found admirable for the purpose, as it is thicker than the ordinary tin foil or pattern metal. 22 karat gold No. 34 gage was used to form the cap. This is readily burnished into the depression and over the elevations of the tooth. The lap of the metal was made on the labial surface of the tooth. The screw being cut, the end was filed, while it was held in the chuck of the lathe to a small point, A, Fig. 6. A small piece of gold was punched with a steel point, while the metal was placed on a piece of lead at B, Fig. 7, and the point of the screw A of Fig. 6 was inserted into the hole B of Fig. 7. The screw was then soldered at this point with a minute piece of *20 karat solder.* The end of the screw (A Fig. 6) being filed flat, the plate (Fig. 7) was burnished to fit the cap Fig. 2, permitting the screw to stand erect over the cutting edge, as shown, and when thus fitted the end C of Fig. 7 was tacked with a minute piece of *1½ k. solder* to the palatal part of the cap Fig. 2. The position of the screw being corrected and alligned, it was then permanently soldered to the cap, as shown by Fig. 2.

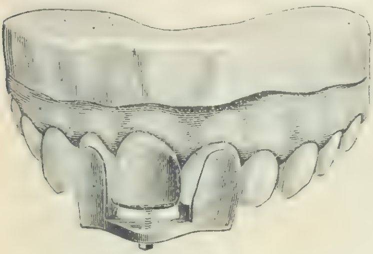
FIG. 8.

FIG 6.

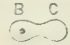

FIG. 7.

The yoke (Fig. 4) was soldered to the two caps which covered the right lateral and left central incisors. This was fastened to these caps with adhesive wax and so manipulated while the wax was soft, that the hole drilled into it would permit the screw of the cap (Fig 2) to pass easily through the hole in the yoke. The wax being chilled, the caps were lifted from the die, invested and soldered. The yoke attached to these caps is shown in Fig. 5.

We simplified the making of these caps because it would have been very difficult to make caps for these teeth with the very small space we were able to obtain. We considered that it was not important to cover all these three teeth, since the action of the nut against the yoke would tend rather to force these caps *on the teeth* rather than to

pull them off. With the cap (Fig. 2) this was different, as the strain of the screw tended to pull this off.

This unfortunately occurred, the strain of bringing the tooth down being greater than the holding capacity of the cement.

We therefore had to remove the appliance, and we drilled a small hole about the 1 32 of an inch deep through the palatal face of the cap (Fig 2) and into the palatal surface of the right central (such place being frequently the seat of decay, especially in the lateral incisors). This hole was drilled transversly, that is, the hole ran from the mesial towards the distal edge of the tooth, commencing at the palatal depression of the tooth. Into this hole we fitted a platinum pin obtunded from an old mineral vulcanite tooth, and when the cap was reapplied the pin was passed through the cap and into the tooth, affording as we hoped greater strain being applied to the tooth.

We omitted to say that when the appliance was put on the teeth, the cutting edges of the two lower central incisors were dressed down about the 1 32 of an inch, as these parts of these teeth struck forcibly against the palatal edge of upper central incisor which we wished to draw down.

In about *five days* after the second application of the appliance, the tooth was drawn from its socket sufficiently to take off the appliance. This was done with some difficulty owing to the pin which we had inserted in its palatal face, so much so that the cap (Fig 2) had to be destroyed before we were able to do this. The young lady said that the traction for the first two days gave her considerable pain. Fig. 8 shows the appliance in place on the teeth.

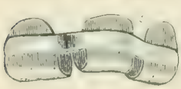

FIG. 9.

The teeth having been brought into position, caps were made similar to those shown at Fig. 3, only not thickened at the cutting edges, to fit over the left central, right central, and right lateral incisors, and these caps were united with a strip of gold and then cemented to the teeth as a retainer. This was done to do away with the cumbersome and uncomfortable yoke, which, if employed as a retainer, would have had to remain on the teeth for six months. Fig. 9 shows the retainer, and Fig. 10 shows the case completed, the distal cutting edge of the right central being dressed down so as to make it conform to the shape of its fellow.

FIG 10.

[Advance Proof of Editorial for July number of *Buffalo Dental Practitioner and Advertiser.*]

THE SEMI-CENTENNIAL OF THE DISCOVERY OF ANÆSTHESIA.

The year 1844 gave to surgery one of the greatest boons ever conferred upon suffering humanity. The discovery of anæsthesia marked a distinct era, and the credit of it, by universal consent, belongs to dentistry. As in the case of all other great discoveries, a number have claimed to originate it, but the consensus of opinion has awarded to the dentist, Horace Wells, of Hartford, Conn., the honor of first demonstrating it, and his name is enrolled among those highest in the temple of fame as being one of the greatest benefactors of any age. This is the semi-centennial year of its discovery, and dentistry should not miss the opportunity of reminding the world of the debt which it owes to a member of the young profession. Dentists themselves use anæsthetic agents largely in their practice, and they would be recreant to duty and prove themselves but ingrates if they did not in some way mark the occasion by a fitting observance of the anniversary.

The Odontological Society of Pennsylvania took action early in the year, by appointing a committee to take the matter into consideration. The Dental Society of the State of New York, at its annual meeting early in May, appointed a committee to take action upon the part of the dentists of the State. The Connecticut State Dental Society, at its annual meeting, passed resolutions which will be found on another page of this number, and appointed a committee to arrange a semi centennial celebration, and other societies will doubtless take similar action.

But the subject is too great and too comprehensive in interest to be monopolized by any single body of men. Every dentist throughout the world is concerned in the matter, and should have an opportunity in some way to assist in celebrating an event that must be to him a matter of personal pride. But the time is limited, and whatever is to be done must be done quickly. Half the year has flown without any general organization having been effected, and unless immediate action be taken the most momentous event in our professional history will not receive the attention which its importance demands.

In this emergency we take the liberty to suggest that every dental society in the land, as far as possible, appoint delegates to meet at Old Point Comfort at the time of the annual sessions of the American and the Southern Dental Associations, there to agree upon some concerted plan of action. It is no time for any elements of personality

to enter into the consideration of the matter, or for any claims of priority in conception to be urged. Let us as one man unite in honoring ourselves and our profession, by doing honor to the memory of the man who did so much to honor us. We sincerely hope that there will be a unanimity of feeling among us, and that every dental society, especially every State organization, will through its proper officers appoint a committee to meet at Old Point Comfort, Virginia, in August next. We commend the subject to our brother editors of dental journals.

As Chairman of the Committee of the Dental Society of the State of New York, Dr. W. C. Barrett will be glad to receive communications from other like Committees.

We heartily endorse the suggestions of the *Buffalo Dental Practitioner and Advertiser*, and trust that this fitting time to do honor to Dr. Horace Wells, may not be permitted to pass without according to his memory, and the great discovery that he made, all honor and praise. We are pleased to bring the matter to the attention of our readers, that they may, in their attendance at the National Dental gatherings, act in this matter in the honoring of the man whose philanthropic heart was not circumscribed by the saving of pain only for his patients and those needing dental services, but who took in *all suffering humanity*. Let us do him all honor, and let his name be written in letters of gold on the pages of all Dental journals throughout the land.

UNIVERSITY OF BUFFALO—DENTAL DEPARTMENT.

The second annual commencement exercises of the Dental Department of the University of Buffalo were held in connection with those of the Medical and Pharmacal Departments, in Music Hall, in the city of Buffalo, on the evening of Tuesday, May 1st, 1894.

The examinations before the Board of Curators (comprising the State Dental Examining Board) took place during the day, and at their close the following candidates for graduation were recommended to the Chancellor for the degree of Doctor of Dental Surgery, which was accordingly conferred upon them :

Arthur G. Bullock.	Joseph W. Beach.	Frank L. Sibley.
Joseph L. Povall.	Seymour C. MacDougall.	Wm. H. Snider.

The session opened September 25, 1893, and closed May 1st, 1894, after a full term of seven months. The number of matriculants was eighty-six.

The next term will open September 24, 1894.

A. P. SOUTHWICK, Secy.

SELECTED ARTICLES.

THE RELIEF OF PAIN FROM DISEASES OF THE DENTAL PULP AND PERIDENTAL MEMBRANE.

BY A. W. HARLAN, M.D., D.D.S., CHICAGO, ILL.

The dental pulp is a frequent cause of pain after near or actual exposure of its surface to external agencies. When the pulp is exposed by accident the pain is easily relieved by protecting it from the air or moisture with chloral camphor, phenol camphor, oleate of cocaine, melted carbolic acid or other local anæsthetic. The surface should be dried if possible before making the application. A mixture of collodion and carbolic acid, ten or twenty per cent, will serve as a temporary dressing. Twenty parts of carbolic acid, five parts of the hydrochlorate of cocaine and seventy-five parts of liquid vaseline will arrest pain from exposure of the pulp. I have frequently used twenty parts of a four per cent. solution of cocaine, thirty parts of pure oil of sassafras and fifty parts of melted carbolic acid as a local covering. This is only slightly caustic or escharotic. The bottle should be shaken before using when the mixture is fresh. The pain from a hyperæmic pulp is quickly relieved by puncture, when possible; if not, torsion will sometimes relieve the pain. Remedies administered internally for retarding the circulation will seldom be effective in relieving the hyperæmic condition. Sometimes when torsion is practiced the addition of counter-irritation may relieve the pain. When the pulp of a tooth has been capped with any material before it is in a normal condition, there may be pain, continuous or intermittent. Should this continue in spite of torsion or counter-irritation, the filling must be removed. Even this will not always relieve the pain and the pulp may have to be destroyed before the pain will cease. Of course it is understood that a pulp should not be capped when irritated or inflamed, but many pulps are capped in this condition and the only salvation for them is to remove the capping.

The pain from a pulp where calcification of its substance is going on cannot be relieved permanently save by destruction of the organ. If the patient can endure the pain, in a course of time the pulp will be obliterated. Usually the patient will not endure such agony for very long, and unless relief is afforded, the tooth will be extracted by some other dentist.

The pain from congestion of the pulp and the formation of pus in its substance can only be relieved by getting direct access to it and pricking it to relieve the overfull vessels. After the tension has been relieved, the pain does not always cease. It has been a favorite

method with me to wash the cavity with peroxide of hydrogen at once and quickly dry the cavity; apply pure chloroform on cotton, then melted carbolic acid. In five or ten minutes the patient will be comfortable. It is my theory to destroy the pulp if there is no probability of saving it. I might attempt to coax it back to health if it were an exposed front tooth in a young person's mouth. There are few cases where it is possible to retain the vitality of a pulp after suppuration of a small portion of its substance. The mere puncturing of a pulp with a sharp pointed instrument to relieve congestion or hyperæmia is not always sufficient reason for the destruction of a pulp unless the vital powers are low or the patient is past fifty years of age; then the recuperative forces may not be sufficient to enable it to live under a capping. Drying the surface of a suddenly exposed pulp and painting it with collodion will arrest pain. When the pulp is dead and the pain results from pressure of pus beyond the apex, the manifest duty of the surgeon is to give it exit, through the root-canal or by drilling into the alveolus through the process. If a simple pericementitis has to be dealt with, calcium sulphide 1-10 gr. pill every ten minutes until six have been taken will ordinarily arrest pain. Prior to this an aperient may be administered. Citrate of magnesia, a Seidlitz powder, hunyadi janos, or some other internal remedy. Counter-irritation, tincture of capsicum, cantharides, ammonia, chloroform, absolute alcohol or a metal disc of the size and thickness of a copper cent dropped in boiling water before using it. When there is a pocket alongside the root, wash with pyrozone, then inject into the pocket two or three drops of vinum opii or a twenty per cent. solution of menthol in alcohol, or ten per cent. acid carbolic in liquid vaseline. Bathe the face in hot water, place towels or napkins on the face after dipping them in water at 140° F. Keep changing them and relief will come. When the pulp is exposed at the apex, destroy it.—*Ed. in Review.*

OBTUNDING SENSITIVE DENTINE.*

BY HENRY BARNES, D.D.S., CLEVELAND, OHIO.

The subject of this paper has been chosen, not because I have any new thing to offer, but that discussion may be provoked, and, if there be any new thing of value, that it may be brought to our knowledge. Who of us has not felt the need of some agent having the power to destroy the sensitiveness of the dental organs during the time in which they are being operated upon?

*Abstract of a Paper read before the Ohio Dental Society, December, 1892.

In the past we have had Von Bonhorsh, Herbsi, and a score of others, who have heralded the dental world a sure remedy, only to find us resorting to well sharpened steel, after they have been tried and found wanting.

We must possess a remedy which will not damage or destroy the tissue upon which we work, possessing at the same time obtunding properties.

I said in the opening of this that I had nothing new to advance; but I leave with you my mite, hoping it will receive at your hands a fair trial. Don't expect too much, for absolute success is not claimed.

After the dam is applied I take Dr. Black's 1-2-3 mixture, or oil of cassia, wintergreen, or other essential oils, on a pledget of cotton, placing the cotton in the cavity, and with my chip syringe, having a platinum point, draw the heated air from the lamp, heating the nozzle of the syringe red-hot, blow gently on to the cotton until the oil is driven from it. This is done repeatedly, until the cotton looks as though scorched by fire. Now, removing the cotton from the cavity, we are able to cut out quite a considerable amount without pain to the patient. This is especially true of the leathery white, or light brown, decay found in the teeth of young children.

I find this method is so successful that I employ it in all cases of this character, and seldom fail. It is also a great help in many other cases.

The little instrument made by "Small's Thermal Appliance Co.," of Providence, R. I., which throws a spray of heated alcohol into the cavity, is also a very good way to obtund sensitiveness of dentine, and in my judgment, no office is complete without an instrument of this character.

DESTROYING PULPS WITH ARSENIC.*

BY DR. LEROY REQUA.

The uncertainty attending the use of arsenious acid for the purpose of devitalizing the pulps of teeth renders its use unpleasant and unsatisfactory in many cases.

Many combinations of arsenic with other drugs, such as morphia, iodoform, cocaine, and the like, have been recommended to us in the form of nerve-pastes and powders, to facilitate the speedy and painless death of the pulp.

They all leave much to be desired. We have tried them, and found

*Read before the Union Dental Convention, held in Rochester, N. Y., Oct., 1893.

them wanting. Much or part of the trouble arising from the use of arsenic, either alone or in combination, is due partly to the careless manner in which the application is made, and partly to the pressure caused in sealing the drug in the cavity. The best success I have ever had has been during the past year and a half, and I have been using clear arsenious acid and lots of care.

My method has been about as follows: Let us suppose a case of exposure in a molar, with a large crown cavity. The frail and overhanging edges are trimmed and cut back, so that a good view can be obtained of the pulp, or place where it ought to be.

With a large spoon-excavator the carious matter is removed as far as possible, without cutting into the chamber. If there is a tough, leathery skin surrounding and partially covering the pulp, it is left intact. The cavity is then bathed with oil of cinnamon, and the pulp is ready for death.

Next, from a piece of good, tough spunk, is cut a thin disk that will cover about one-half of the floor of the cavity. This is moistened with carbolic acid, and the smallest possible quantity of Squibb's arsenious acid is worked or pricked into one side of the spunk. This is then placed death side down on a glass slab, and dried with bibulous paper.

The cavity is made ready in the usual way, and the disk of spunk applied directly to the pulp. The cavity is then dried with hot air and sealed with gutta-percha. In sealing, a small piece of gutta-percha is warmed in the flame and mashed thin between the thumb and finger. This is placed on a curved spatula and drawn across the cavity, thoroughly sealing it without pressure.

A pledget of cotton is sometimes placed in the bottom of a cavity before sealing, to prevent pressure.

In approximal cavities, where the cervical wall is below the margin of the gums, the gutta-percha is pushed down against it with a thin bent spatula after the cavity is sealed. This prevents all danger of leakage and death to surrounding tissues.

According to Truman, the action of arsenic on the pulp is, first, excitation of the sensory nerves; second, paralysis of the whole nervous system of the pulp. Death does not follow until some time after, or until the arsenic is slowly absorbed.

The point which I wish to impress is this: The arsenic being worked into the little disk of spunk, does not give the exciting effect or shock to the sensory nerves that it would were it placed there in a mass, in full strength.

The absorption takes place more gradually, and before much pain is felt paralysis begins, and by this time the full power of the drug is at work.

Different writers vary as to the time occupied for the complete destruction of the pulp, some holding twenty-four hours is sufficient, others forty-eight hours, one even recommending repeated applications extending over five or six days. My own experience has taught me that twenty-four hours is quite long enough to leave an application of arsenic in a tooth. Then the pulp can be extracted before the stage of paralysis has passed off. In the majority of cases, when the arsenic has been left for two or more days, a soreness of the tooth is complained of, and a marked congestion of the peridental membrane will be found.

In the anterior teeth, where conditions were favorable, I have had the best success from applying arsenic in the morning, and cleaning out the canal and filing in the afternoon. Another point which I wish to mention, is the generally accepted theory that an inflamed an and aching pulp will not take kindly to arsenic. My experience has led me to believe that this is something of a fallacy. I have repeatedly had exposure of long standing, when the pulp was blue with congestion, and had given pain for days, succumb in twenty-four hours after the treatment by this method. We have all too often heard the same tale of woe, sleepless nights and hours of pain and suffering following the application of arsenic.

I am happy to say that in the past year and a half I have had only one or two cases in which the pain continues for more than one hour. In most cases the pulp was quiescent on the patient leaving the chair.

Again I will say what I said in the beginning, that the devitalization of living pulps with arsenic is uncertain and unsatisfactory, and it is hoped that in the near future we will have an agent upon which we can place more dependence.—*Dental Practitioner.*

A FEW THINGS TO BE REMEMBERED.

BY L. P. HASKELL.

In ninety-nine per cent. of mouths the centre of the palate is hard and unyielding—in fact, the only portion of the upper jaw which does not change from absorption or yield to pressure. Unless provision is made for it, the plate will, sooner or later, rock. This should be remedied by "relief," in metal plates, of a thin film of wax on the model, extending well up on the anterior portion to near the margin

of the process, and to within a quarter of an inch of the rear of plate. In a rubber plate the relief can be made by burring or scraping the plate.

There are more failures in artificial dentures from *faulty articulation* than from any other cause. To guard against this, in adjusting a denture in the mouth, see to it that none of the six anterior teeth touch—in fact, leave a margin of space. This will prevent the tilting of the plate from the rear. Be sure the bicuspids and first molars on both sides meet uniformly; have no pressure on the second molar, and especially if the lower occluding molar leans forward, as it would crowd the denture forward.

In arranging the *lower* teeth, commence with the second bicuspid so as to ensure a perfect interlocking of the cusps. The fronts must be accommodated to the space allotted to them by crowning or overlapping, if needed.

In ordering teeth from the dealer, see that bicuspids and molars are provided that have a good length of porcelain *above* the pins, so that if necessary to grind, in articulating, the porcelain will not be ground away. The teeth will also present a more natural appearance. Insist upon this from your dealer.

If you desire to restore the expression of the mouth which has been sacrificed by the extraction of the cuspid teeth, remember this invariable rule, viz.: the plate can and should be worn higher over these teeth than elsewhere, and the artificial gum made fuller.

Leave the necks of the cuspids slightly fuller than the other teeth.

Finish the rubber with a festoon around the necks of the teeth.

In selecting teeth for metal plate and crown work, if you desire *strength*, use the perpendicular rather than the cross pins, and they are less liable to crack in soldering, and do not let your dealer give you anything else.

In polishing metal work, use *oil* with your pumice, both on the felt and the brush. To reach all the depressions and interstices, drive a pine stick into the lathe chuck made for it, and with a sharp knife turn it to a blunt point.—*Ohio Journal.*

CONCERNING VARIOUS METHODS ADVOCATED FOR OBVIATING THE NECESSITY OF EXTRACTING DEVITALIZED TOOTH-PULPS

BY DR. W. D. MILLER, BERLIN, GERMANY.

Read at the World's Columbian Dental Congress.

The practice now in vogue among good practitioners, of thoroughly removing the pulp and filling the root-canal to the apex, is usually so

easily carried out in the incisors and cuspids, and gives such sure results, that there is no probability that a better method will ever be found. But when we extend this treatment to the bicuspids and molars, the labor and expense entailed are frequently so great as to put it beyond the reach of the great majority of the human race, and the method is not always successful. It will consequently be a great boon if some means or method can be devised which would render unnecessary the removing of the pulp and filling the root-canals of molars.

While every dentist has now and then knowingly left remains of the pulp in narrow and tortuous canals, or in canals obstructed by calcific matter, and while many dentists in Europe have contented themselves with simply devitalizing the pulp, filling over it with amalgam, and *leaving the root to nature*, the first *systematic* attempt to do away entirely with the necessity of extracting the root portions of the pulp appear to have been made by Witzel, who, in 1874, presented the view that an application of arsenious acid carefully made to the inflamed pulp devitalized only the disease tissue, and that by amputating the coronal portion of the pulp twenty-four hours after the application, the ends of the root-stumps might be treated as healthy, freshly exposed pulps.

Dr. Miller then presented briefly the methods devised by Witzel, Baume, and Herbst, the latter as put forth by its author and as modified by Bodecker, and summarized their advantages and disadvantages. Continuing, he said :

Perhaps the majority of dentists have also made more or less extensive use of the method recommended by Bodecker, when they have left a portion or the whole of the pulp in the buccal roots of upper or mesial roots of lower molars, and filled directly over them, after thoroughly bathing them with carbolic acid or some other antiseptic.

I have for a long time felt that the solution of the problem was to be sought for in the direction pointed out by Witzel, except that our efforts should be directed not to retaining the vitality of the root-stumps, but to preventing their subsequent decomposition, by impregnating them with a suitable antiseptic. I am convinced that the success of the impregnation method depends, to a very great extent, upon the character of the antiseptic employed, and upon its chemical action upon the pulp apart from its antiseptic action.

The qualities desirable appear to me to be :

1. It must be a strong antiseptic.

2. It must be sufficiently soluble and diffusible to guarantee the impregnation of the whole pulp.

3. It must not be so diffusible that it will be completely taken up by the surrounding tissue and finally disappear altogether, as is the case with applications of carbolic acid. It is my impression that there is greater danger in too great solubility than in insolubility.

4. A coagulating action upon the tissue of the pulp appears desirable, though not absolutely essential. A pulp which is coagulated into a hard insoluble body is less likely to furnish nourishment for bacteria and offer irritation to the periapical tissue than one in a soft or semi-liquid condition. One cause of the failure of Baume's borax treatment is probably the conversion of the pulp into a liquid, or semi-liquid, soapy mass, with a strong alkaline smell and reaction, which can hardly be indifferent to the tissue about the apical foramen.

5. It is desirable that the substance employed have no irritating action upon the pericementum.

6. It should not discolor the tooth, although, as the treatment concerns chiefly molars, a slight discoloration need not be considered as a very serious matter.

7. Solid substances are better adapted to the purpose than liquids.

It is difficult to find a substance which fulfills all the above mentioned conditions.

According to the results obtained from over five hundred experiments, I have divided dental antiseptics into three groups:

1. Those possessing in a high degree the power of imparting antiseptic qualities to root-pulps, such as cyanide of mercury, bichlorid of mercury, diaphtherin, sulphate of copper, salicylate of mercury, oil of cinnamon, orthokresol, carbolic acid, trichlor phenol, chlorid of zinc. The last four are, however, decidedly inferior to the others; they penetrate the pulp very rapidly, chlorid of zinc surprisingly so, but they are lacking in the necessary powerful antiseptic qualities, and are so diffusible that in the course of a few weeks they disappear altogether from the pulp.

2. Those of doubtful value: Thymol, salicylic acid, eugenol, campho-phenique, hydronaphthol, A and B naphthol, aceticotartrate of aluminum and some essential oils, resorcin, thallin, sulpho-carbolate of zinc, oil of birch, iodid of sodium, nitrate of sodium, etc.

4. Those nearly or quite worthless: Iodoform, basic anilin coloring matters, borax, boracic acid, dermatol, europhen, chlorid of lime, peroxid of hydrogen, sozoiodol salts, iodol, tincture of iodin, spirits of camphor, naphthalin, etc.

The attempt to apply these results to practice was first made with the bichloride of mercury, which has been used since 1890 in some

four hundred to five hundred cases, first in the form of small tablets, having the composition :

Sublimate ....0.01 gram
Boracic acid.............................0.02 gram

or,

Sublimate ....0.01 gram
Common salt ....0 02 gram

The pulp having been completely devitalized, the pulp chamber was thoroughly opened and cleansed, and a tablet applied and slightly crushed with an amalgam plugger, moistened with water and covered with a layer of tin foil (I now use gold foil), and the amalgam or cement filling immediately inserted. In about thirty per cent. of the cases severe pain occurred on the day following the application, and on account of this disagreeable symptom these tablets were abandoned and the following substituted :

Sublimate...............................0 0075 gram
Thymol..................................0.0075 gram

These are applied in the same manner. The thymol being chiefly designed to prevent the thymol being so rapidly absorbed, besides giving a greater permanency to the application by reducing its solubility. Very seldom, so far, has pain followed the use of these tablets, while experiments out of the mouth show that they still possess sufficient penetrating power.

Another combination employed is :

Sublimate...............................0 005 gram
Thymol..................................0.005 gram
Tannin..................................0.005 gram

This combination is somewhat empirical, though the design of the tannin will be apparent to every one. The combination does not penetrate as rapidly as No. 2, and discolors the tooth more.

Cyanide of mercury has also been employed in combination with thymol in the following form :

Cyanide of mercury ....0.0075 gram
Thymol..................................0.0075 gram

Also the salicylate of mercury in the same form. This I think deserving of a trial. Its sparing solubility justifies the belief that its action will be more permanent than that of sublimate. The sulphate of copper may be used in pure form, but it naturally causes serious discoloration of the tooth at the neck, and is also, I fear, too soluble to give permanent results in pure form. More recently I have directed my experiments toward the discovery of some substance which possesses the desired qualities without discoloring the tooth.

Thus far I have obtained the best results from diaphtherin (oxychina-septol), an antiseptic recently introduced by Emmerich. It may be applied in pure form. Among liquid antiseptics the oil of cinnamon takes the first place, and I have much faith in its power to conserve the dead pulp. Like all the liquids, however, it is difficult to apply, and has, besides, the disagreeable quality of discoloring the tooth yellowish brown. The combinations which I have chiefly employed is that of sublimate and thymol. (I have not had opportunity to sufficiently test the others in practice, though I am now using, by way of experiment, the salicylate, and to some extent the cyanide of mercury.) It has been employed at the Dental Institute of the University of Berlin in over two hundred cases. Of these, only one failure has come to my knowledge.

Time is the only test for methods like those under consideration, and we can scarcely expect to arrive at a definite conclusion in less than five to ten years. Nor should we be hasty in the application of methods of this nature. One or two cases every month, at least for the first year or two, is all that a careful dentist ought to risk in private practice. Cases should be chosen which are very difficult to treat, and which are otherwise frequently treated by the forceps, such as distal cavities of second or third molars, buccal cavities of third molars, etc. It is not possible at present to form a reliable estimate as to the value of this method of treating teeth; it may also be that much better materials will be found for the purpose than those suggested above. There are, at least, reasons for believing that by a careful application of this method, many teeth may be saved which otherwise would be sacrificed to the forceps, or, what is much worse, be allowed to crumble away.

[The President exhibited two small bottles containing the preparations which Dr. Miller had recommended, and passed them around for inspection.]

DISCUSSION.

Dr. Frank Abbott (New York City)—I take entirely different views of this matter from the author of the paper and the gentlemen who have been quoted. The only one condition where I think of using any material for devitalizing the pulps of teeth is where it is impossible to stop pain. I have, perhaps, in the last fifteen years used arsenic in teeth as many as three or four times, and no more. To detail to you how I avoid using arsenic and keep my patient along in a comfortable condition would be comparatively a large story. The line of treatment after devitalization, or of a tooth with a dead pulp,

a question of more importance apparently, as borne upon by this paper, than any other.

For a number of years I have had a practice that seems, from what has been said in reference to it, to be rather unique. I never depend upon the application of an antiseptic in the roots of teeth, but upon a material which I force in and around such, with which is combined an antiseptic strong enough to answer the purpose, and virtually mummify all the material that is left in the canals of the tooth by its action. It surrounds and covers it over, and whatever portion of the pulp is left behind is penetrated by the action of the chlorid of zinc and bichlorid of mercury that is mixed with it. Of course, if the pulps die, they die of their own accord. I have many dead teeth to handle and many to treat in my practice, as every one has who is in full practice, and I treat them all in one general way. That way is to open the pulp-chamber as carefully as I can, so that I may cleanse it thoroughly of every particle and get thoroughly into all the root-canals. I then, with a very fine gold-pointed syringe, use a 1-in-10,000 solution of bichloride of mercury—a grain of bichloride of mercury in twenty ounces of water—and syringe out these canals just as thoroughly as I can; I then, with a broach or small instrument, penetrate into the canal as far as I can go, stir up the contents, and then wash again, repeating this until I am pretty sure that everything is clean, so that the substance coming out of the tooth, as it strikes a white napkin, will show a white, clean color, instead of staining, as when the canal is filled with dead material. When it is washed thoroughly clean, I fill with oxychloride of zinc, in which I put a drop of a solution of 1 in 2000 of bichlorid of mercury, thus combining the antiseptic properties of the bichlorid of mercury and the penetrating and antiseptic properties of the chlorid of mercury, and the penetrating and antiseptic properties of the chlorid of zinc and oxid of zinc.

This is the material that mummifies or holds this substance that is left in the roots of the teeth, leaving it in a condition to give no trouble; and it may astonish some of you to know that, instead of opening a tooth and treating it day after day for a week or more, I open a tooth and fill it at the same sitting always, unless I have periosteal irritation—soreness of the tooth as I touch it. The crown of the tooth is filled with gold or any substance that I choose to use, of course, and I dismiss the patient after painting the gums carefully over with a solution of concentrated tincture of aconite root and tincture of iodine. That I always do before my patient leaves the chair. It is a powerful counter-irritant, and does the work of relieving the pressure around the root of the tooth. This, to me, is the

simplest, easiest, and most quiet way of getting along with that kind of teeth.

It is the decomposition of the canal contents and the gases accumulating from that decomposition all the time forcing themselves into the pulp canal that cause the pain in such cases; the gases cannot get outside, because the cement upon the surface of the root is living tissue, consequently all openings into the structure are closed to the escape of gas except that which would be taken up in the circulation. In the other way the opening is there, so that all the gases pass into this pulp canal.

In the substances that we use for root-filling we must bear this in mind, that the results of decomposition are what we have to deal with, not the decomposition itself.

Dr. George Cunningham (Cambridge, England).—It is now some years ago since I had the opportunity of knowing what Professor Miller was doing, and of employing some of these tabloids. So far as cases of this kind are concerned, they are limited, as Dr. Abbott has said. I have no doubt there is a certain percentage of failures. I am acquainted with Dr. Herbst's method of treatment, and I do not believe in his system of hermetic sealing. I support Prof. Miller's statement, which I believe is right, that we can get as good hermetic sealing by his process as by tin in the cavity.

I have tried the Herbst system with so-called "cobalt." Dr. Herbst kindly sent some to me, and my colleague, an eminent chemist, after examining it, said, "In that bottle you have enough arsenic to kill the whole British nation." Prof. Miller delivered an introductory course of lectures on operative dentistry, and showed these experiments in retaining the pulps alive by the cupric and sulphate method. I have used that method in wisdom teeth. Of course the alternative treatment is the forceps. If we could find for poor people some means which will shorten the treatment, I trust it will be the practice as used by Dr. Abbott, which will give the opportunity to fill at one sitting. I think the paper we have had to day is of very great importance, because it has pointed out one way that we can bring our operations within the reach of larger numbers of the community.

Dr. Schrier (of Vienna) addressed the Congress in German, and it was translated by Dr. Ottofy as follows:

It is indifferent what antiseptic is used; each one leads to the same result. It is only necessary to find material which is easily applicable. If any one says that he can take an antiseptic material and inject it into the fine canals, it is a matter which is impossible to comprehend. It is necessary that the material should be one which

is readily introduced into the root-canal, and whose effect is prompt and immediate. Such a material Dr. Miller did not mention in his essay, but I have published a material of this character—potassium-sodium—which, on another occasion, I will present to the members of the Congress.—*Dental Review.*

OBITUARY—CORRESPONDENCE.

CHICAGO, April 10th, 1894.

EDITOR—Dear Sir: Resolutions on the death of Professor W. H. Eames, of St. Louis, at the regular meeting of the Chicago Dental Society, April 3d, 1894:

WHEREAS, It has come to the knowledge of the members of the Chicago Dental Society that the dental profession is called to mourn the loss of one of its most distinguished and honored members; therefore, be it—

Resolved, That in the decease of Professor W. H. Eames the world has lost one of its foremost educators, his family a devoted husband and father, and the profession a sincere, earnest and useful devotee. It is fitting that this society should pay its tribute of respect to one who has so long and honorably filled positions before the world, and we mourn his death as a personal loss to each and all of us.

Be it further Resolved, That a copy of these lines be transmitted to the family of the deceased, and a further copy be sent to the journals for publication.

A. W. HARLAN,
TRUMAN W. BROPHY,
EDGAR D. SWAIN.

BOOK NOTICES.

"THE BUSY DENTIST."

This is a new dental journal which makes its bow with the April number. We tender it our congratulations and encouragement, and wish it every prosperity. If it can fill its future pages with as interesting, practical and valuable articles and extracts as appear in its initial number, it will be doing all that can be expected to make it sought after and acceptable.—[ED.

PAMPHLETS RECEIVED.

"A Partial System of Dental Nomenclature," adopted by the Faculty of Northwestern University Dental School, 1894.

We have also received from Messrs. Hood & Reynolds a very handsomely gotten up pamphlet on "The Process of Refining and Manufacturing Gold Foil."

DENTAL SOCIETIES.

At the annual meeting of the Chicago Dental Society, held in Kindergarten Hall, April 3d, 1894, the following officers were duly elected for the ensuing year: President. J. H. Wolley; First Vice President, C. E. Bentley: Second Vice President, D. M. Gallie: Recording Secretary, A. H. Peck; Corresponding Secretary, H. A. Costner; Treasurer, E. D. Swain; Librarian, J. J. Whaley; Director, J. N. Crouse.

H. A. Costner, Cor. Secretary.

THE PRACTICAL PLACE.

Clean Joints Again.

The most effectual way of having clean joints between vulcanite block section teeth, is to have *no joints at all*. To those who have a "Downie Furnace" this may be accomplished with the front blocks, which are the ones which are most necessary to have perfect, by lifting them off carefully from the base plate before waxing the case, placing them in their exact relative position in the muffle and fusing a little "pink body" in the joints. This unites the two blocks of six teeth into one, when they may be replaced on the base plate, waxed, flasked, packed, vulcanized, and finished.

Don't.

Don't anchor a bridge by inserting a pin or bar into an adjoining tooth or cavity and expect the filling or anchorage to be permanent.

Don't advise crown or bridge work unless there is a fair chance of their proving a success, for one failure will count against you more than one hundred successful ones.

Don't attempt to make a bridge without having two or more good roots or teeth to anchor to. No bridge can stand unless it has abutments.

Don't set a crown piece of bridge work when you know of a flaw in the work that will be likely to endanger the durability of the case. It is better to correct it before it is set, rather than have to remove it.

Don't write papers on "don't." Tell people what to do and tell it in your best style. Copy what is good from others and give credit for it. Don't give histories of mythical cases, and don't recommend a new method on one trial—try again. Give us your individual thought, your individual experience, your individual experiments. Read what others have written on a subject and thrash it over till its own father will not know it, but don't write a paper on don'ts. If

you make a discovery, tell it at once ; don't wail till next year or you don't get credit for it. Don't wait a minute longer, but write that paper *now.*—EDITOR, *Review.*

CINNAMON AS AN ANTISEPTIC.

"No living germ of disease can resist the antiseptic power of essence of cinnamon more than a few hours," is the conclusion announced by M. Chamberland, as the result of prolonged research and experiments in M. Pasteur's laboratory. It is said to destroy microbes as effectively, if not as rapidly, as corrosive sublimate. Even the scent of it is fatal to microbes, and M. Chamberland says a decoction of cinnamon should be taken freely by persons living in places affected by typhoid or cholera.—*Scientific American.*

BRUBAKER (A. P.) ON THE ETIOLOGY OF PUS FORMATION.

In the formation of pus, the first element, apparently, has been overlooked. The formation of pus is, of course, simply one of the stages of inflammation, and inflammation is invariably preceded by a state of congestion, by which is meant a condition of paralysis of the walls of the smaller blood-vessels. As soon as there is this impaired circulation there is an aggregation of the white blood-corpuscles along the walls and the emigration into the surrounding tissue. With the cessation of the blood-flow there is at once an impairment in the nutrition of these tissues which leads to a lessening of their vitality. This is the first step, and which has been alluded to as retrograde change in the tissue cells. The mere emigration of the white blood-corpuscles through the cells of the blood-vessels, carrying with them various germs, would not in themselves give rise to the formation of pus. Germs in and of themselves cannot produce pus until there is impaired vitality of the tissues, which allows them to disintegrate the tissue molecules. Therefore I don't see how it is possible for pus to be formed anywhere in the body, except on the surface, unless you have the two factors, impaired vitality and presence of the germ. How the germ gets in the subcutaneous tissue to produce pus is, of course, a question, but I think they are absorbed by the white blood-corpuscles and are carried by them to the tissues, because they are constantly migrating.—*Extract International.*

DR. DANIEL E. MORSE exhibited and demonstrated the use of his mitering-angle gum-tooth-jointing instrument, and gave the following description of it: "The method consists in removing the gum

sections from the model in the relative positions they occupied thereon, and securing them by means of heated paraffin and wax to the mitering instrument. The sides of the separate blocks designed to come in opposition are ground on the sides of a corundum wheel at the same time and at the same angle, and a true joint thus formed, one that touches front and back, leaving no V-shaped space." Dr. Morse exhibited his improved displacement gauge for measuring rubber and other substances. It is called the "exact displacement gauge," and is so sensitive that the addition of a few drops of water will be registered.—*Cosmos.*

"I Guess."

It takes a lot of guessing before one discovers how many beans thers are in a quart bottle. But somebody either guesses right, or guesses near it. Still it is pure conjucture.

Sometimes we are disposed to guess that there is a good deal of this random reasoning in our profession; that sometimes very dogmatic opinions are pronounced as the etiology, for instance, of pyorrhea alveolaris, upon no sounder reason or pathology than pure guess-work. Perhaps it does no harm after all, and an ignoromus may blunder upon the truth while a genius is diligently in search of it. Nevertheless, if dentistry and dental pathology are admitted to the rank of scientific professions, we must not imagine that there is a separate and distinct pathology of the teeth and adjacent structures, or that we can ignore the possibility, and indeed the frequent certainty of the constitutional origin of the local diseases we treat. Etiology and symptomatology need to be more strictly studied in relation to dental disease. The fact is, if we stop to think about it, it is often easier to diagnose upon correct principles, than to guess. Our pathology should not be conducted like a bean-guessing bee.—*Editorial Dom. Den. Jour.*

Polishing Rubber Plates.

Perhaps the greatest difficulty experienced in constructing an artificial denture with plain teeth is the polishing of the pink or granular rubber rim, the festoons of which are hard to follow with the wheels and cones ordinarily used for the surface. This may be accomplished easily by the use of soft rubber tubes one and a halt inches long, cut from the tubing used on the Bunsen burner. Run the tube on the cone of the lathe one and a quarter inches, leaving the outer end project a quarter. This projecting end serves as a cup,

which, with moistened pumice, will reach and nicely polish the curves and depressions between and around the necks of the teeth. The entire outer surface of the cylinder is useful in polishing the rest of the rim surface, and the acute depressions in the lingual surface of the plate.

To Soften the Hands.

℞—Fowler's solution.

Liq. potassæ arsenitis ....fl. ℥iv.
Glycerin .... fl. ℥iii.
Bay rum (genuine) . ...fl. ℥xvj.
Aqua pura ....fl. ℥xxxij.

Use as hand wash.

—A. C. Hewitt.

The Spraying Apparatus.

A spray will remove much from the mouth that nothing else will reach. Use a hydronaphthol solution with it. Use it after operations for gingivitis. Use it to remove particles forced up under the gum in using the corundum wheel. Use it to dislodge stray particles of tartar which, in removal, lodge under the gum. Use it for the removal of pumice refuse. Use it for a patient with soft gums, and a generally filthy condition of the mouth. Try it, and you will never be without it.—R. Ottolengui.

To Disinfect and Bleach Teeth with Putrescent Pulps, and Immediate Root Canal Filling.

Adjust the dam carefully; flood pulp chamber and canals with strong sodium-peroxide (50 per cent. saturated.) This is a non-coagulant mechanical cleanser, a solvent of organic debris, a stirilizer of dentine, an active bleacher. Then apply on cotton dilute sulfuric acid; wash out, dry with hot air and fill immediately. In the upper teeth apply the sodium-peroxide on wisps of asbestos fibre. The strong solution would disintegrate cotton.—E. C. Kirk.

To Prevent Brass from Tarnishing.

Brass may be effectually preserved from tarnishing by lacquering—that is coating with a kind of varnish that will dry very hard.

Lacquery are usually spirit varnishes—that is, solution of resinous matter in alcohol. The leading resin used is shellac, the average proportion employed being four ounces to the pint. Other resins are

often added such as copal, sandarach and mastic, in varying proportions. The varnish may be colored yellow if required, with gamboge; a reddish tint that is given by dragon's blood.

Articles to be lacquered are often heated moderately by a hot plate, just before applying the liquid, which may be done by dipping, or painting with a soft brush; and heat is again applied in some cases after lacquering, and continued until the varnish has become hard.

These varnishes will of course become scratched or rubbed by continuous handling, and then the metal may become exposed.

When brass has become tarnished, it may be cleaned by washing with alkali, or dipping in weak acid, or both; and it should be subsequently polished with chalk.—*L. H. C., California.*

To Secure Perfect Adaptation of Cap to Root.

Place a piece of thin copper (or tagger's tin) about the root and ligate securely. Force plaster of Paris in the open end of tube thus formed, up to the root. When set, remove all together and pour fusible metal into the end of the tube that was about the root, forming a perfect model on which to construct the cap.—C. Frank Bliven.

Immediate Root-filling When There is no Visible Abscess,

Remove mechanically as much as possible of the devitalized pulp. With syringe wash the canal repeatedly with $\frac{1}{1000}$ solution bichloride of mercury. Without drying plug the foramen with a bit of cotton, and fill with oxichloride, mixing one drop of $\frac{1}{2000}$ bichloride of mercury in the cement. Complete the cavity filling immediately, and paint the gum with tincture aconite and iodin, equal parts, as precautionary.—*Frank Abbott.*

The Secret of Success.

We see around us successful lives and wonder why we too are not successful. What are the secret springs that make this mighty difference? They do not appear any smarter, naturally, than we are. Yet they pass us on every side, and the public applaud them, while we are unobserved, unrewarded, and unappreciated. We are at last ready to believe that perhaps, after all, mere chance, luck, "good fortune" makes the difference.

But we only see the results. The feverish longing and tireless energy that leads to careful reflection, the thorough studiousness and incessant struggle that brings refinement, the intense willing and con-

suming enthusiasm that forms habits of industry, the self-sacrifice and painstaking planning that moulds mind and spirit and muscle for some definite purpose, that makes the rough man polished, the blundering man skilful, and the wandering, fixed, steady, definite, powerful at some given point—all this we do not see.

The best written composition, the most acceptable oratory, the greatest works of art or industry, is that which conceals the labor that produced it. So the most successful life stands before us ready made, the rubbish all cleared away, the labor all hidden, and the losses and processes which have brought perfection all covered with springing life and beauty.—*Dominion Dental Journal.*

THE METRIC NOMENCLATURE is coming into such common use especially in scientific articles, that the following formulas will be found valuable.

WEIGHT EQUIVALENTS.

To convert grains into grammes multiply by	0.065
To convert grammes into grains multiply by	15.5
To convert drachms into grammes multiply by	3.9
To convert ounces (avoir.) into grammes multiply by	28.4
To convert pounds (avoir.) into grammes multiply by	453.6

MEASURE EQUIVALENTS.

To convert cubic centimeters into grains multiply by	15.5
To convert cubic centimeters into drachms multiply by	0.26
To convert cubic centimeters into ounces (avoir.) multiply by	0.036
To convert pints into cubic centimeters multiply by	473.
To convert liters into ounces (avoir.) multiply by	35.3
To convert gallons into liters multiply by	3 8

—*Scientific American.*

DEATH FROM NITROUS OXIDE.

Death from inhalation of nitrous oxide is unusual. But Thornbury reports such an accident in the *Medical News.* After some preliminary remarks regarding the effects of nitrous oxide, a brief report is made of an autopsy in this particular case. The subject was a woman. Four gallons of nitrous oxide gas had been administered by a dentist for the extraction of four teeth. Soon after the induction of anæsthesia the patient began to show signs of embarrassed breathing. Medical aid was summoned. The pulse became rapid and attempts at breathing spasmodic. Artificial respiration was resorted to; the lower extremities were elevated. Nitro-glycerine ($\frac{1}{100}$ grain) was ad-

ministered hypodermically, and ammonia applied to the nostrils. The patient seemed to rally for a short time, but unconsciousness continued, the pulse became more rapid and feeble, and the heart's action finally ceased. This case illustrates the invariably presence of danger in the administration of anaesthetics ; even of the supposed harmless " laughing gas."

Softening Wax, etc., on Models or Bites.

In separating wax or composition from the cast, full time should be given for the *sufficient softening of the entire material.* Though the outer parts may be soft, the parts which grasp the teeth may be hard, and so endless trouble and vexation will be encountered by the breaking of essential parts of the plaster cast. This is an important point to be observed, and the operation should only be entrusted to a substitute whose carefulness can be depended upon.—*Chas. Hunter.*

A Method of Root Filling.

At the Indian State Dental Society. Dr. Oliver said : Nearly everybody uses gutta-percha points dipped in chlora-percha to fill roots, but I have noticed a great many bad results. I have lately been in the habit of taking a hypodermic syringe, inserting the needle up into the root and filling the canal with chloroform. Then, after dipping the gutta-percha point in chloroform, I insert it into the canal, and force it home while the canal is still wet with chloroform.—*The Ohio Dental Journal.*

To Relieve Severe Headache, Following Dental Operations.

Administer a single drop of nitro-glycerine (one per cent solution) in half a glass of cold water.—*E. H. Bowne.*

For an excellent varnish, procure a piece of clear amber, scrape or powder it, dissolve in Squibb's chloroform, which will take some time, add a little absolute alcohol to delay evaporation, and you have a varnish so hard that it will resist almost anything.—C. F. Ives, *Inter.*

Chemically Pure Gold.

Pure gold is largely employed in electrotyping. It is obtained by treating the crude metal with nitro-hydro chloric acid, from which it is precipitated by sulphate of iron, but so finely divided, as not to be

separated on filtering. This objection (according to R. Lueders) is obviated by the addition of a liquid carbohydrate, such as kerosene oil, which is advantageously combined with borax or an alkali. On stirring the mixture, the gold is completely taken up by the carbohydrate; the latter, according to its specific gravity, is deposited either above or below the other fluid, from which it can be removed, and the gold will now remain upon the filter.

A Gentleman who was in Madrid for a number of years—Dr. Thomas—devised a plan for destroying pulps that seems so admirable that I want to tell it to you. He puts his arsenic, morphine and cinnamon together, and having chopped up finely a quantity of cotton, mixes the medicament with it, and fills a bottle with the combination. It is ready for use whenever required, and is very comforting and quieting if the pulp is in a state of irritation. This preparation will not ooze out on the gum. I have been using it for five or six years.—*E. A. Bogue, Inter.*

To Make Vulcanized Rubber Soluble.

The method adopted at the rubber clothing factory at Muhlhouse is said to be as follows: To 400 parts of the mass add 1,000 parts of water, and 60 parts (by volume) of an 8 per cent solution in water of hydrogen peroxide, and heat in a water bath for four hours, to a temperature of 80° C. If too much of the peroxide is used the mixture becomes permanently fluid, but with 12 volumes of water to 1 volume of the peroxide, the rubber dissolves, becoming solid again on cooling. As a thickener, the factory uses a mass prepared by by boiling for one hour 300 parts of decorticated linseed, 100 parts of water, 250 parts of acetic acid, and 8 to 10 parts the solution of hydrogen peroxide.

Plaster of Paris.

The method of testing the quality of plaster of Paris is by taking a small pinch of the powder between the thumb and finger and gently rubbing it; if small particles of grit are felt, it indicates that parts of the plaster have already absorbed water, and it is therefore unfit for use. The same test may be observed by taking a pinch of the powder again and placing the fingers under water, and then rubbing in the same way as before. If, however, in both of these tests no grit is felt, and under water a thin, creamy substance is formed, which is easily rubbed off the fingers, the plaster is in a proper condition for

use. Where plaster has been kept for a long time, or where it is gritty, its condition can be very greatly improved. It may be re-dried by putting it in a metal dish, such as a pie plate or iron pot, and placing in an oven of a hot fire or over a gas jet. As soon as it becomes heated it will be observed that a process identical with boiling water is taking place. When this ebullition has entirely ceased, the powder is freshly kiln-dried. If the method of testing is again resorted to, it will be found that the gritty appearance and feeling will have disappeared, in a very large measure, leaving only the fine dry powder ready for use. If there are any lumps remaining, they may be removed by the use of a sieve. From what has been already said, it will need be but a reminder that the plaster of Paris must always be kept in a hermetically sealed jar, or in a very dry place.—*Charlotte Medical Journal.*

Regulating Teeth.

Sometimes, in making a vulcanite crib or covering over the bicuspids and molars to be used as a buttress or point of resistance for the jack screw to press against, this crib drops off or loosens, thus defeating the object. We have found that they may be made to hold securely by lining the entire surface with moderately thin oxyphosphate cements, wiping the tooth dry and forcing the crib in place. After it has set hard the pressure on the jack screw may be applied, with no fear of its coming off or getting loose.—T. F. Chupein.

Tooth Paste.

Precipitated chalk	12 ozs.
Prepared chalk	6 ozs.
Powdered orris root	6 drs.
Powdered soap	1½ ozs.
Oil of rose	12 drops.
Oil of cloves	8 drops.

Glycerin a sufficient quantity.

Carmine, enough to color.

The glycerin should be added after the powder is otherwise completed, when it can be made into a paste with the same.

To Clean and Polish Aluminum.

Sheets of this metal are rendered beautifully white by dipping them first into a strong solution of caustic potash and afterwards into benzine; the latter removes all dirt and grease. When thus

cleansed, they are plunged into a bath of 2 parts of nitric acid to 1 of water, next into strong nitric acid alone, and finally into a mixture of equal parts of vinegar and water. They are then carefully washed in pure water, and thoroughly dried in hot sawdust. A very brilliant luster may be imparted to objects of aluminium, without much rubbing, by immersing them in an emulsion produced by shaking together equal parts of olive oil and rum.

Tooth Soap.

	Parts.
Talcum	1,000
Orris root	200
Oil of peppermint	10
Oil of sage	5
Oil of calamus	4
Oil of origanum	3
Oil of thyme	2
Coumarin	6
Soap powder	500
Alcohol	200
Glycerin	100

Beat together to form a soft paste. Press the mass into molds, and, after removing the cakes, brush the latter over with tincture of benzoin containing a little oil of peppermint. When dry, cover with tin foil.

The Decline of Strength.

Men are not as strong now as they used to be. This is due largely to the way they live. The present is a locomotive age. Everyone wants to get money and get it in a hurry, too. Consequently, health is a minor consideration nowadays in the mad race for wealth. Men think of money sleeping, waking and even eating. The result is first that the mind is overworked and naturally the body fails. People cannot rob themselves of sleep, bolt down food against time and violate every law of nature and expect to be healthy and strong. Nature is a jealous mistress and demands her just dues.

Men who wish to become strong must rigidly follow the example of their good old ancestors. Eat, drink, work and play as they did, earnestly and honestly. Get your full rations of sleep, exercise and rest. Do not give all your thoughts and devote all your energies to "business" and the accumulation of wealth. Above all things do

not steal time from sleep and then "brace up" on cordials or liquors of any kind to enable you to get through your day's work, physical or mental. Too many, alas, try this after late suppers and "theatre parties" of the night before. That is, the "upper ten" do. The "lower five" do the next worst thing. They "nerve up" on whisky or an absinthe cocktail to enable them to get through a day's labor after a night of dissipation.

How then, in the name of goodness, can men be strong when they follow such practices? Their ancestors, were they native born Americans, Irishmen, Englishmen, Germans, Norwegians, Swedes, or what not, did not do it, and consequently were a stronger and better race of men. Their's was an age of industry, not of luxury, hence their physical superiority. Our children can become as strong as our fathers, if they but follow their example and not ours. A simple application of nature's laws will remedy all defects. Learn then to walk, run, box and wrestle as you would a problem in arithmetics. Practice, too, indoor athletics. Cultivate every muscle of the body and you are bound in time to become strong. If you have any disease of the lungs, heart, liver or kidneys, exercise judiciously taken, is sure to ameliorate if not entirely cure it. Be careful, above all things, not to overtax your powers. Take exercise constantly, but lightly. When you feel the least bit "done," stop work instantly. Too much exercise is liable to prove more harmful than none.—J. W. Kennedy.

Testing Gold and Silver.

Use pure nitric acid. To test, file the metal clean to make sure that you are testing the metal itself and not a plating or covering of any sort. Silver under the action of the acid goes to a peculiar grey color. If brass, it will turn green, German silver will do the same, nickel will go black. Gold, pure, 22ct. or 18ct., will be unaffected, and the acid will stand like water, 15ct. will turn very slightly brown if the acid is pressed well in with the bare finger, 12ct. will go the same without any prsssing in, 9ct. goes a decided brown at once.—*English Mechanic.*

Hypnotism in Disease.

The chief argu ments used against the employment of hypnotism in disease are, first, that it subordinates and enervates the will; second, that it renders the patient liable to be influenced by persons of evil intent; and, third, that only nervous of hysterical persons are subject

to its influence. My own experience is that it may be used without injurious effects, and, also, that it may take the place of narcotics in a large number of cases in which they are now used. I have myself used it with advantage in delirium, in insanity, and in chronic alcoholism. I have successfully treated one case of kleptomania and two cases of excessive irritability of temper. At the same time hypnotism is a two-edged sword. Wielded by an unskilled hand, it may cut both ways deep into the faculties of intellection and into the nervous system generally. Also, it should never be used save by a skilled hand upon patients of an unbalanced mind accompanied by what is known in medical parlance as *paranoia*. In my treatment of a perfectly healthy, calm, intelligent, unimaginative man, whom I operated on fifty-one times, I found that the diapason of his whole mental and emotional system would give forth concordant sensations of pleasure, or discordant sensations of pain, at the will of the operator.

Summing up, I would say that hopnotism, as with every other new remedy, there is great danger that, on the one hand, it may be used indiscriminately, or, on the other hand, be scouted by a senseless skepticism. It has, beyond doubt, its definite limits of usefulness, and the medical man of the present day, realizing the futility of many of the old methods of treating disease, should keep his mind open to the reception of every new discovery.—JAMES R. COOKE, M.D., in the *Arena*, *Boston.*

RELIEF FOR TOOTHACHE..

Melt white wax or spermaceti, two parts, and when melted add carbolic acid crystals, two parts. Stir well until dissolved. While still liquid, immerse thin layers of carbolized absorbent cotton wool and allow them to dry. When required for use, a small piece may be slipped off and slightly warmed, when it can be inserted into the hollow tooth, where it will solidify. The case produced by this simple method is really very great.—*Brief.*

MANLY SPORT NEGLECTED.

Everybody can become strong. I am not one of that number who believe that the race of men have degenerated. The trouble with this age is that it is too ease seeking, and manly sport is neglected. The age is a commercial one, and physical prowess plays but a secondary consideration in the daily affairs of life.

Would you breed a race of strong men like the hardy Danes, Norsemen, Normans and Saxons, who conquered Europe? If you

would, encourage and foster manly sport of all kinds. Indulge in outdoor games in Spring, Fall and Summer, and in indoor games in Winter. Go more to the gymnasium, river, field and cinder path, and less to the theatre and tap room.

I am not an ascetic and do not urge total abstinence from the cup which cheers. Enjoy such things in moderation. But I do say do not let them take precedence over manly sport. Whatever time you can spare from your business extend to sport of some kind, not as a mere observer, but as a principal.

Now, would you know how to get strong? First, indulge in outdoor exercise. Walking is the best. When your system is tuned up, try gymnastic exercise. Light dumb-bells, light clubs, the rowing machine, and what boxers call the "medicine ball," will all aid in the solution of the problem. Do not cultivate any one set of muscles at the expense of the others. Work them all. Go at your task easily at first, and increase as you find your strength increasing. Never exhaust yourself, but quit exercise feeling stronger than you began, and with the desire to continue. Never fail to take a quick shower or sponge bath after your exercises are concluded, and a vigorous rub-down. Cool off and rest thoroughly before eating, and do not gorge yourself with food any more than work. Take solid, substantial food and such as your own good sense or your physician advises that your system needs, and above all things avoid excesses in the way of liquor or tobacco.

If you follow these precepts, you are bound to become strong, but it will take some self-denial to do it.—Louis St. Cyr.

The simplest way to tell iron from steel is to pour on the metal a drop of nitric acid, and allow it to act for one minute. On rinsing with water a greyish white stain will be seen if the metal is iron; a black one if it is steel.—*Toronto Mail.*

In applying the rubber dam to labial cavities under the gum, take a small sized sewing needle, at the distance of, say, three-quarters of an inch from the point, and bend it into the form of an S, the point of the needle forming the long leg, stick the point into the neck of the tooth below the rubber dam, just above the edge of the cavity, lift the upper edge of dam over the eye end of the needle, and the resiliency of the rubber will keep the needle in place, and the cavity dry. It is far ahead of any clamp for the above purpose. To prevent the eye of the needle penetrating the dam, put a little head of shellac on the end.—*Extract Dom. Jour.*

THE

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IRREGULARITIES.

A form of irregularity, such as is shown in Fig. 1, has become of late years of such frequent occurrence that various devices have been used to correct it. We re-published from the *International Dental Journal*, in our issue for July, 1892, at pages 103, 104, 105 and 106, a plan adopted by Dr. W. T. Davenport, of Paris, France, for the correction of such a case by means of twisted wire and a vulcanite plate covering the roof of the mouth, as well as the molars and bicuspids of each side.

Fig. 1

But children revolt at such appliances, and, susceptable as they are to ridicule, they not only are obliged to put up with the discomfort of such an appliance, but also with the jeers of their school companions while wearing them.

Any plans, therefore, that will enlist the co operation of the patient and mitigate his discomfort should be tried.

Deformities of this kind produce a great disfigurement of the conntenance, as is shown by Fig. 1, and when an unsightliness is rectified so as to produce a harmony, such as is illustrated at Fig. 2 of the same case, the aid of all parents should be enlisted in the work

A correct impression of the upper and lower teeth is taken, with modelling compound, to serve as a history of the case, and the two

models made from these are placed together to show the natural articulation, as is shown by Fig. 3. A plaster of Paris impression is taken of the two central incisors, and after the sides of this are luted, *crown*, or low melting fusible metal, is poured into this impression. This gives a correct die of the front teeth, over which a gold cap may be accurately fitted, by burnishing pure gold of No. 30 or 32 gauge, to it, after having first made a thin lead pattern of the cap.

FIG. 2

The cap made, as shown by Fig 4, two little hooks or headed platinum pins, such as may be made by breaking an old vulcanite tooth and using the pins from it, are soldered to it on each disto-labial edge as shown by the cut

We next proceed to bend, *in the mouth*, around the first molars two thin German silver bands. This is done by passing the metal, which should be about one-eighth of an inch wide, around these teeth, and drawing it tightly against the tooth by seizing the ends with a pair of flat nose pliers, as shown by Fig. 5. The band thus formed is carefully removed from the tooth and heated *red hot while held by the pliers*. By doing this, when the pliers release their hold of the ends of the band, the metal being changed by the heat, will not spring away, and they can then be accurately soldered together, as shown by Fig. 6. The band thus formed may be placed on a wooden stick or tapering mandril, and the ends which have been soldered may be filed as shown in Fig. 7 A, or the soldered ends may be bent backward so as to form a hook.

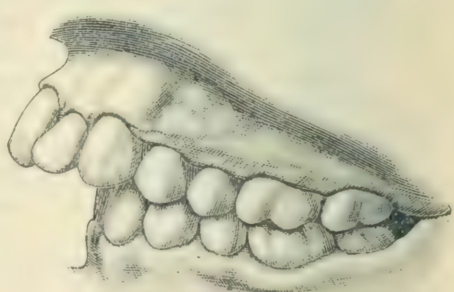

FIG. 3.

These preliminaries accomplished, the cap, Fig. 4, is cemented to the two front teeth with phosphate cement, and the bands also cemented to the molar teeth. It may be a valuable precaution regarding these molar bands to solder a small tick, at some suitable point, to them, and when they are cemented to the teeth to bend the tick over the masticating surface to prevent the band working up to the neck of the teeth, burying itself in this tissue, and causing intolerable pain. Fig. 8 shows the tick soldered to the band.

FIG. 4.

FIG. 5.

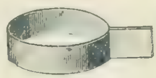

FIG. 6.

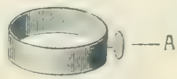

FIG. 7.

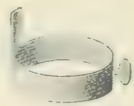

FIG. 8.

The bands and caps being adjusted, as shown by Fig. 9, elastic bands are hooked over the pins or hooks of the cap and stretched back and hooked over the molar bands.

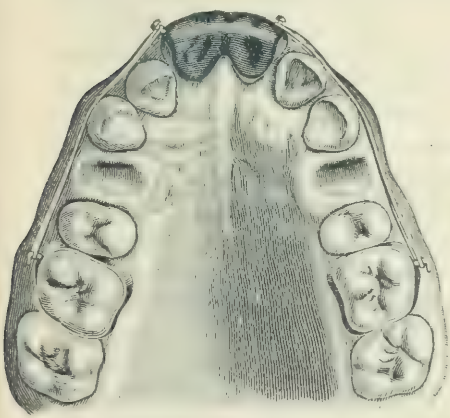

FIG. 9.

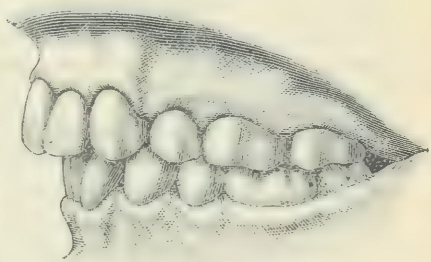

FIG. 10.

We omitted to say that in order to obtain room for the backward traction of these teeth, the first bicuspids were extracted. Fig. 10 shows the condition of the teeth when the operation was completed.

It might be found that the elastic bands after having been worn a week, loose their strength or elasticity, in which case they should be changed weekly or oftener. The progress is slow, but as the appliance gives little discomfort, is therefore no impediment to mastication, or to the proper cleansing or brushing of the teeth, the time consumed is not of much moment.

Should the elastic bands slip down and bury themselves into the gum, this may be rectified by placing a little hook over the eye teeth, which will lift it from the gum, and hold it in position by the resilience of the rubbbr. Such a hook is formed of a piece of plate, snipped by the shears so as to make two ends on one side, and a single end on the other; to the single end the hook is bent, while the two extensions are pressed over, in order to let the point of the eye tooth protrude. Fig. 11 shows this device.

Fig. 11.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED BY THEODORE F. CHUPEIN, D.D S.

Dr. Naaman H. Keyser gave an interesting talk upon a simple and practical method of soldering aluminum, illustrating his remarks by a variety of specimens of aluminum soldered to aluminum and to other metals. These specimens were closely examined and tested by the members present and found to be strongly united. He stated that in his early experiments in the working of aluminum, he was convinced that the real difficulty in soldering it was due to the presence of a thin film, evidently non-metalic, and presumably an oxid, upon the surface of the aluminum. This film when the metal is exposed to the atmosphere, seems to form instantaneously, so quickly, indeed, that it seems impossible by ordinary means to present to the solder that clean metalic surface essential to a perfect union between the metal and the solder. The ordinary fluxes fail to prevent, or to remove from the aluminum, this objectionable surface, and are therefore useless. He had found, however, that by first heating the aluminum to the fusing point of the solder used, and then scraping the surface of the aluminum under the melted solder so as to break up or remove the non-metalic film, union immediately takes place. The components of the solder, provided that it fuses at a lower temperature than the aluminum, does not seem to be material. Pure tin may be used or an alloy of tin and silver, or tin, silver and aluminum, or tin and aluminum. The tin may be so largely in excess that the solder can be worked by the soldering iron. In this case, however, the soldering iron should be made of aluminum. If made of any other metal it will alloy with the solder and impair the work. On the other hand, the more infusible metals may be added until the fusing point of the solder approaches that of the aluminum, and the blow-pipe flame is required for its manipulation. In either case, by scraping the surface of the aluminum underneath the molten solder, a

perfect union is readily secured, without any flux whatever. The best alloy for dental use he had not yet determined. It seemed probable from his experience so far, that for soldering aluminum to aluminum it would be best to alloy the aluminum sufficiently only to reduce its fusing point low enough for use, while if the metal to which the aluminum is to be united be one for which a strong affinity, as for instance, gold or platinum, it is not safe to employ a high temperature, and a solder that can be used with a soldering iron is to be preferred.

Among the specimens presented was an upper case, a swaged aluminum plate, to which had been soldered a rim and staples, the teeth being attached to the plate with pink rubber.

During the discussion which followed, the merits and demerits of aluminum as a base for artificial plates were fully canvassed ; the consensus of opinion being, that except for special cases it was not a good material to use. The possibility of making of it a practical piece of work was freely admitted, but there was doubt expressed as to its durability, and its facility of repair except in the hands of those expert in its manipulation. Between a cast and a swaged plate the latter seemed to be regarded with more favor, the rolled metal being more dense and stronger than the cast, and being more readily constructed by the ordinary appliances of the dental laboratory.

Dentists are often requested by patients to put fillings of gold in artificial teeth, so as to disarm suspicion.

This has been accomplished by having cavities drilled with diamond drills, into the artificial teeth and these cavities filled with gold. While this may do in some cases, the drilling weakens the tooth, or the cavity has to be drilled in a surface that may not be desirable. Or it cannot be carried over the cutting edge of a central or lateral incisor in imitation of a contour operation. This difficulty has been sought to be corrected by the use of gold paint applied to the tooth at any point or in any shape desired, and the paint subjected to heat in a furnace, several coats and several burnings appearing to produce the desired result. But by this plan it has been found by some of the members present that the gold would wear or peel off.

Dr. Keyser had been making experiments in his "Downie Furnace" to this end also. Should he desire to put a filling in a mineral tooth in imitation of a contour or any other kind of gold filling, he grinds or roughens the mineral tooth with small corundum stones in the dental engine, at the point and in the shape he wished the filling to be. On the roughened part he placed some "Downie enamel," taking care that the enamel added to the roughened surface did not extend

beyond the ground or roughened part. While the enamel was still moist he placed on it a piece of "mat gold" previously moistened, over the spot where the enamel had been applied, large enough to over-lap the edge of the enamel applied. It was then fused in the furnace, the heat being sufficient to fuse the enamel, but not to melt the gold. After it cooled and was removed from the furnace it could be burnished, or if thought desirable more gold could be added to that which was held in place by the fused enamel.

Dr. Trueman spoke of an article published in the "Journal of the British Dental Association," for January, *1893*, where Dr. Geo. M.P. Murray, who speaks of "A new form of removable bridge work," in which he showed how he constructed such a denture on roots that were divergent, using the very means which Dr. Elliot used in an almost similar case in *1844*, which was published and illustrated in the "American Journal of Dental Science."

Dr. John Hellings exhibited a specimen of abnormal growth or deposit of tartar, the accretion of twenty-five years. The deposit was over the remaining crown of an upper second or third molar which it completely covered, extending on all sides of it. The deposit measured one and a quarter inches long by one inch wide, and was about three quarters of an inch thick. The patient, an old lady, who wore a plate of artificial teeth, over and around which it was also deposited, giving form to the deposit in the neighborhood where the plate approached the tooth. In removing the tooth, which was very loose, Dr. Hellings, although using great care, fractured the deposit, but was able to adjust the parts and restore them with plaster of Paris. It was the largest and most extensive deposit that had ever been seen by any of the members. Dr. Chupein stated he had seen a very large specimen in the possession of Dr. J. W. Clowes, of New York, but was disposed to think that Dr. Hellings' specimen was the larger.

Dr. Hellings also exhibited a portable pallet of his invention, made of semi-vulcanized rubber. It was about two inches in diameter and consisted of three receptacles, one for gold cylinders or pellets, one for absorbent cotton, and another in which a small annealing spirit lamp could be placed and held steadily with no fear of tilting. The whole device was held on the side of the left hand by means of a rubber ring through which the thumb was inserted, leaving this as well as all the fingers free for use. The device was very ingenious and seemed to promise considerable usefulness and aid to the operator.

SELECTED ARTICLES.

RELATIVE TO IMMEDIATE ROOT FILLING.

AND A FEW ITEMS CONCERNING THE MANAGEMENT OF TEETH WITH PULPS DEAD BEFORE TREATMENT.*

The more I have thought about these subjects and read about them, the more impossible it appears to say anything new, and the only excuse for this paper is to say that as long as we see repetitions of incorrect, fallacious or misleading theories and opinions regarding them, and the advocacy of inadequate, injurious or impracticable modes of procedure, so long it will be necessary and useful to repeat correct theories and opinions, and describe suitable modes of operating. No attempt will be made to cover the whole field, for this paper must be short, and doubtless there will be opportunity in the discussion for some of you to mention items that you may think more important than those I shall describe.

Immediate root filling may be defined as the filling of roots at the first sitting when anything is done within the pulp chamber or canals, or, if a pulp has been devitalized, filling at the same sitting when the pulp is removed.

The subject of immediate root filling has often been discussed with reference to the possibility of it, and the cases in which it can be done without danger of disastrous consequences following, rather than upon the broader grounds of its suitability, convenience and general utility.

A paper on this subject was read before the Illinois State Dental Society at its last meeting, which discussed very briefly the question "Is immediate root filling advisable:

1. After heroic extirpation of a live pulp?
2. After removing a devitalized pulp?
3. After removing a putrescent pulp?
4. When there is peridental membrane abscess with fistulous opening?
5. The same without fistulous opening? (Blind abscess.")

The essay gave an affirmative answer to each proposition. These cases appear to include about all diseased teeth requiring root filling, except those presenting themselves with acute pericementitis or acute abscess. Whether the essayist would also fill these at the first sitting did not certainly appear from his paper, but it is hard to see why he should not, unless deterred by the illness of the patient or the sore-

* Read before the Chicago Dental Society, February 6, 1894.

ness of the tooth, from making a sitting sufficiently long to accomplish it.*

The first two heads, namely, "After extirpation of a live pulp," "After removing a devitalized pulp," are so nearly alike in their relations to this question that they may be considered together. These cases furnish the most frequent and suitable opportunities for immediate root fillings, and there are no serious objections to them if required by convenience or necessity. However, when we remember that a large proportion of root fillings have to be made in bicuspids and molars, and consider the difficulty of getting away all portions of the pulps from small roots, we often find that root filling, "after the removal of all pulp tissue" does not always prove to be so very "immediate." Probably the recently described methods of cleansing pulp canals by means of kalium-natrium, or dilute sulphuric acid, may make the accomplishment of it at one sitting more practicable than heretofore.

The objections to immediate filling in these cases (after extirpation is complete) relate to the difficulty of controlling hemorrhage or exudation, and consequently of obtaining complete dryness of the canals, to the irritability or sensitiveness of the parts at the apex, manifested by severe pain during the introduction of the filling, and which is apt to be much greater if the filling is carried to the apex as it should be, than if it stops short of its proper destination, and lastly the liability of greater soreness and discomfort following the operation, than would be the case if delayed to another sitting,

There are many cases in which these objections do not exist, or may be easily overcome, and many others in which they *may* be overcome or endured if it is desirable or necessary, and there can be no universal rule of practice laid down, but every operator will form his own habits in the matter, and in accordance with his preferences, or the special requirements of his particular practice. It is likely that country practitioners will complete these operations at once in a much larger proportion of cases than those in cities, whose patients are more accessible, and in the habit of being more fully subject to the requirements of their dentists in the matter of numerous sittings.

The third class of cases, those having putrescent pulps, should have a broader definition, if intended (as appeared from its treatment in

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* Dr. S. R. Clayton, in a paper before the Indiana Society, last June, describes several cases, among which was one with very acute pericementitis, and one with acute blind abscess, both of which were successful. (He mentions no failures.)

the paper) to cover the cases all the way between, but not including, those devitalized and filled without sepsis, and those in which an abscess had been formed. The first of the sub-heads in this class is suppurating pulps; the second, putrescent pulps, and a third, those in which the decomposition and removal of the pulp is complete, but without the formation of an abscess. Each of these three subdivisions implies that the pulp chamber or root canal is open or has been open.

The most significant and important thing about all these cases is sepsis or infection, and there are two decisive objections against immediate root filling, unless for some reason the necessity for it is so urgent as to justify the taking of considerable risk.

The first objection is in the fact that disinfection, to be thorough and trustworthy, requires time for its accomplishment. The second objection is the impossibility of knowing certainly, whether the apical space has been infected, or whether it is infected during the operation, which is liable to happen, notwithstanding all possible care, if the work is completed at the first sitting. A very large proportion of those cases will do well if immediately filled, and some of them are so near like the preceding ones as really to belong with them. For instance, if a suppurating or putrescent pulp shows some life, and its removal is followed by somewhat free hemorrhage, the portion next the apex appearing to be in a nearly normal condition, there would be little fear of trouble if immediately filled. If, however, the whole root canal appears to be in a septic condition, it cannot be cleaned and filled at once without an unjustifiable risk of subsequent trouble that could probably be avoided by taking more time.

The first point to be gained in these cases is the disinfection of the root canals. This is more quickly and surely accomplished after the removal of so much of their contents as can be got away without danger of forcing anything through the foramina. Then some strong and diffusible antiseptic should be placed in them for some days. (Free diffusibility is more important than great strength or concentration.)

This application may usually be tightly closed in by a gutta percha stopping, though a vent will sometimes prove necessary. At the second sitting the canals may usually be safely cleaned out to the foramina, though I have seen cases in which oil cassia and myrtol had been tightly enclosed for a week without developing the least trouble, which yet became acutely inflamed and in some instances formed abscesses, after thorough cleaning and treatment at the second sitting, showing, (probably,) that the disinfection of the apical portions of

the root canals had not been so complete as was expected. (There may be some cases in which acute peridental inflammation is caused by the antiseptic instead of by infection, but if that is the cause it will not develop into an abscess.)

The third sub-class above mentioned, (in which the decomposition and removal of the pulp are complete,) are not always certainly distinguishable from those having blind abscesses, and the same general line of treatment usually proves appropriate in either case, though if there is active formation of pus, or if it becomes active under the stimulation of treatment, a tight closing in of the medicine is, of course, impracticable at first. That anybody should seriously advocate the immediate filling of roots that will not bear tight temporary stopping for half a day without severe pain and inflammation, which is properly relieved by removal of the stopping, seems incomprehensible. Perhaps no one does advocate it in just these cases, but some certainly do in cases that are impossible to distinguish from these at the first sitting. If there is a dead pulp, with the peridental membrane and the tissues at the apical space in a normal condition, we have only to remove the corpse and disinfect the chamber and canals, but if the apical tissues are diseased, we need in addition to have them cured before we fill the roots, or so far in the way of recovery that the remainder of the process can be depended upon to complete itself. This would seem to be so reasonable a proposition as to need no argument, but it has been urged by some that the foramen of a root is usually so small as not to permit the drainage of a blind abscess through it, or the diffusion of medicines through it to the diseased apical tissues. This is undoubtedly the case in a few instances, but clinical observation is conclusive to the contrary in a very large proportion of cases.

In regard to the immediate filling of teeth with blind abscesses, I will quote from the essay already frequently referred to. "Diagnosis of blind abscess of alveolar process is largely guesswork, because the single item of a wet canal does not prove the presence of pus, nor the existence of an abscess cavity. When blind abscess exists, the accumulation of pus is so very slight that it will cease altogether after the cause has been removed by closing the apical end of the pulp canal. In nearly all such cases, prompt closure at the apex will be followed by noticeable inflammation, if proper care be observed in manipulation within the pulp canal." It is true that the diagnosis of a chronic and quiescent blind abscess is somewhat difficult, and we may sometimes treat a pulpless tooth till assured of its healthy condition, and fill it, without ever certainly knowing whether a small

blind abscess has been cured during the treatment, or whether none ever existed, but there are rather numerous instances in which, after removal of the contents of the pulp canal, the discharge of pus is abundantly sufficient to make the diagnosis certain, and most of us have often passed a fine probe through the foramen into acute abscesses of this sort and seen them discharge so large a quantity of pus through the pulp canal as very effectually to controvert the statement that "when blind abscess exists, the accumulation of pus is so *very slight* that it will cease altogether after the cause has been removed by closing the apical end of the pulp canal." It must never be forgotten that although the contents of the pulp chamber and canals were the first cause of the abscess, when once established, the contents of the abscess cavity may constitute a continuing cause, which it is as necessary to remove, surgically or therapeutically, as to remove that part of the cause contained in the pulp chamber and canals.

I will quote again : "In all cases the apical end of a pulp canal should be permanently closed as soon as the canal is laudable, that is to say, as soon as free from pus or other fluid, and all obstructive matter." "A clear, clean canal is always laudable." I think we can all agree to this if we add the requirement, that by taking sufficient time, and giving proper treatment, we have ascertained that the canal will remain laudable. The statement of the essayist immediately following does not fulfill the requirement, for he says : "I would remove all obstructive matter from the canal, absorb moisture from it till no more appears, and immediatey and permanently fill the canal." It is true that a good many blind abscesses will get well after being once pretty thoroughly drained, and having the canal permanently closed, but no man can certainly tell which ones will fail to do so, and it would seem inexcusable to take so great a risk when there is no necessity for it. The cases of blind abscess are the ones in which immediate root filling is most dangerous and least justifiable.

In closing the discussion, the essayist quoted from, referring to a remark by Dr. Black, to the effect that "Evidence of skill in a dentist is not so much in his success in the large majority of cases that are likely to do well, as with the minority which will give trouble to the patient unless very skillfully handled," said, "Dr. Black has divided immediate root filling cases into majority and minority, admitting that the large majority are successful. * * * *He* did not state what the majority is. Close observation for twelve years leads *me* to estimate the minority at ten per cent. There is no political party under the sun that cares a rap for a minority that represents

only ten per cent." This last comparison is an unfortunate one, for in cases of immediate root filling the minority does not feel bound by the action of the majority, and I assure you, gentleman, that any man who is obliged to confess to a failure of ten per cent. of all his cases of root filling (for this essayist appears to fill everything "immediately") must have urgent need to revise his modes of practice in this particular, and if we remember that this ten per cent. of failures must be nearly all included in those having putrescent pulps, foul canals, or blind abscesses, making the proportion of failures probably at least twice or three times as great for those, we hardly need stronger argument against immediate root filling as a universal practice, than this confession by one of its advocates.

We find a few teeth with dead pulps that are so free from decay as to make it certain that the pulp chambers have never been opened. We do not always feel called upon to disturb them, but frequently we do. In a majority of them sepsis is plainly enough evident, and they must be treated accordingly. Some of them appear to be aseptic, but are not really so, and the proportion in which we may be so sure of it as to fill immediately, is rather small.

The immediate filling of teeth with abscesses having fistulous openings relates to the disinfection of the pulp chamber and canals, as in all other cases involving sepsis, and to the convenience of using the root canals as channels for the conveyance of force or pressure for the evacuation of the abscess cavities, or the introduction of medicines.

There are many teeth in which the foramina are so small as to be useless for these purposes, and they may as well be closed as soon as disinfected, but there are many others in which the root canal and the fistula furnish openings at both ends of the abscess cavity and make it possible to give them much more thorough and successful treatment than would be the case if the canals were closed. This is so much so that a very large proportion of them will get well after one thorough treatment, and many operators feel so sure of that as to fill them at once, but some of them will not get well after one treatment, and it is just as easy to find out whether they will, before we fill them as afterward.

Immediate root filling is theoretically impossible, and even entirely practicable, if circumstances require it, in a very much larger number of cases than those in which it is clinically expedient. Many careful and cautious operators, who can control their patients, will practice it very carefully indeed. Others, more bold, or whose prac-

tice may make it more necessary, will do so very often, but all should draw the line, strictly, at those teeth having the entire pulp canals in a septic condition.

Disinfection of teeth is usually considered to relate only, or, at least chiefly, to the pulp chambers and canals. Occasional appearances seem to indicate instances in which the dentine itself (the tubuli contents) has become so foul as to require that disinfection reach through its substance. It is usually supposed, I believe, that the tubuli of normal dentine are too small to admit of septic germs, but they certainly do sometimes admit freely the products of decomposition, as is evident by the great change of color. Of course, if the dentine is to be disinfected, the time required is likely to be greater than is necessary to disinfect the chamber and canals. Some work lately done by Dr. Black, which, I trust, we shall hear about in due time, seems to indicate that a very considerable amount of organic matter can readily be dried out of an extracted tooth and replaced by water. That diffusibility and displacement are practicable to some extent between the foul contents of dental tubuli and fluids or medicines that can be placed in the pulp chamber, is evident from what we often accomplish in the bleaching of teeth. Whether, with the tooth in the mouth, the tubuli contents can be removed to any great extent by drying, may be doubtful. There is little doubt that the dentine will readily absorb something else to take the place of whatever portion of the tubuli contents *can* be dried out of them. Clinically, it is evident that in most cases we need not give ourselves very much concern about the tubuli contents beyond what is accomplished by the disinfectants used with direct reference to the pulp chamber and canals. Of course such medicines must not be coagulants, or we cannot expect them to accomplish *anything* in the disinfection of dentine.

It has occurred to me, at the last moment, that I might have saved much time by simply warning you of the great difference there is between the great State of Indiana and the equally great State of Illinois. This will more fully appear by a short quotation from a paper, and another from remarks in the discussion following it, both by Dr. J. R. Clayton, at the meeting of the Indiana State Society last June :

" For the past three years my practice has been most radically changed, arguing in the case of pulps purposely destroyed and re moved, that the sooner the parts were turned over to nature for rest and restoration, the better ; that in case of putrescent pulps, if they are giving no trouble while in the canal, none would result when the

pulp was removed and canal cleansed; and, furthermore, if pain had been set up in the peridental membrane, the whole cause was in the putrescence of the pulp, and by removing the cause the effect would cease, and now every pulp canal is cleansed, disinfected, dried and filled at the same sitting, and the success attained has been such that no more thought is given to the future of such operations than to the filling of the plainest molar cavity."

In the discussion he said (in reply to a question about drying roots,) "The anterior roots of the lower molars and the buccal roots of the upper molars I do not disturb. I make no effort whatever to get into the buccal roots of the upper molars. *I believe I have never seen an abscess on the buccal surface of an upper molar.*" (Italics mine.)

In Indiana, therefore, where there are no abscesses on the buccal roots of upper molars, immediate root filling appears to be a great success, and may, perhaps, be practiced with impunity. But in Illinois such abscesses are very common, and experience and observation have taught us that immediate root filling must be practiced sparingly and with good judgment.—Edmund Noyes, D. D. S., Chicago, in *Dental Review.*

A LOCAL ANESTHETIC.

DR. J. E. DAVIS, COLUMBUS, OHIO.

I have been a pretty thorough student of materia medica and chemistry, and have used and experimented with local anesthetics ever since cocain first came to our attention, and cost about one dollar per grain. I have given many of the advertised preparations a fair trial. Some of these were Graham's, Hisey's, Odontunder, Tonalgia, Barr's, Fahenstock's, and others. Some claim there is no cocain in their preparation, but, of course, they simply lie if they say so. The more cocain in a local anesthetic the more thorough will be its effect.

Graham's is the most effective I have used in my office, but not always successful. But as they asked fifty dollars for office right, and three dollars an ounce for the anesthetic, I wanted to know for certain whether or not it was better than my own compound, so I had the doctor representing Graham's anesthetic try his on one tooth in the mouth of an intelligent physician who came in to have some teeth extracted, and I tried my compound on another, and even more difficult tooth than the first, and in an entirely different part of the mouth. The verdict of the physician was slightly in my favor. It

is useless to say I didn't buy an office right. I give my formula for the benefit of those who wish to use it:

Pure water	1 oz.
Cocain, 10 per cent	48 grs.
Antipyrine, 5 per cent	23 grs.
Menthol	5 grs.
Oil cloves	3 drops.
Ether	20 drops.
Glycerin	1 dram.

One drop analin to color red or pink, which is an advantage. Mix these thoroughly, and the ether soon dissolves the menthol. Use with hypodermic syringe.

A good way is first to apply some of the preparation to the gums with cotton pellets, then use the needle, and gradually push the point of needle to the apex of the roots of teeth. It is best to try the anesthetic first on but one tooth, and watch to see if there are any systemic effects. If there are none, go on with the other teeth if there are others to extract. Unpleasant effects are seldom felt. I have extracted as many as twenty teeth at one sitting by using the anesthetic.

Some people are very sensitive to cocain, and this you must look out for, but one tooth will test them. There are no unpleasant after-effects from the use of this anesthetic any more than without using any, aside from the soreness that naturally comes from the thorough use of a hypodermic needle in the gums. I always recommend extract of hamamillis, or Pond's extract, for a mouth wash, which usually prevents any inflammation. There is much advantage in knowing what your anesthetic is made of. Ill success will generally result from ignorance in using the needle.

SULFURIC ACID FOR OPENING ROOT CANALS.

J. R. CALLAHAN, D.D.S., CINCINNATI, O.

It is seldom we see canals in buccal roots of upper molars, or in roots of lower molars, in which a drill can be used; many times in bicuspids and lower incisors, the roots are so flat and thin that drilling is dangerous, yet all these canals may be in such condition that we are compelled to open them for treatment and filling. There are canals that are constricted just at the chamber, sometimes so much so that they can scarcely be found, yet the canal in the root is large and should be opened. There are canals in curved roots and canals obstructed by osseous growths, that if not properly opened, would most likely cause trouble. It is with these difficult canals I wish to deal here.

It has been about four years since I began to open this difficult class of canals by using a 20 to 50 per cent. aqueous solution of sulfuric acid and the Donaldson Root Canal Cleanser. To illustrate the method, let us suppose we have an upper molar from which the pulp tissue has been removed, the palatine root being large, can be prepared by any method you may choose. Let us suppose the canals in the buccal roots cannot be found, we would then place a pledget of cotton saturated with the acid solution in that portion of the cavity near the buccal roots and seal it in the tooth for twenty-four or forty-eight hours ; on the removal of the stopping, wash out with a dash of water from the syringe ; on drying the cavity you will find it white and clean with two dark spots in the vicinity of the buccal roots, showing where the canals can be found. Now we try to enter the canal with the nerve bristle, we find no opening. To make sure we are not being deceived by a constriction, we take a bud drill and follow these stains a short distance ; if we find no opening, or a very minute opening, too small for the bristle, we will feel justified in saying they need no further treatment. But, if with our exploring instrument we find a canal, we will carry the acid to the canal by dipping the instrument in the solution, or by means of the pliers, or better still, the latest pattern of the Dunn Syringe.* Place a drop of the acid in the chamber, and with a No. 5 Donaldson Canal Cleanser pump the acid into the canal ; the acid will soften the walls of the canal sufficient to allow the broach to cut its way into the root; the acid will also thoroughly sterilize the canal and everything in it. No germ or spore can live in the presence of (H_2SO_4) in the strength mentioned. The broach may scarcely enter the canal at first, but if you are persistent it will be but a few minutes till the instrument will go quite a distance into the canal, and you reach the end of the root where a much stronger resistance will be met.

The thickened cement at this point seeming to offer a greater resistance to the acid, the canal can be enlarged by using larger broaches, or if the root is straight the "Gates Glidden" drill will follow the canal just made ; it is more than likely the apical foramen has not yet been opened ; this can be accomplished, if desired, by drilling or by placing a small thread of cotton saturated with the acid in the end of the root and leaving it there over night, and then using the broach and acid at next sitting; after one or two trials you can readily see how crooked or obstructed canals may be opened in a few minutes,

*The Dunn Syringe referred to is made of glass and rubber with platinum or gold point.

and the canal will be in condition for immediate root filling. It must be borne in mind that the rubber-dam should always be in place before the operation is begun ; the adjoining teeth may be protected by placing the dam on none but the tooth to be treated.

I confess that at first sight the application of so strong a solution as 50 per cent looks rather heroic* ; but four years constant use has proven to me that there is little danger of injuring the tooth or the surrounding tissue, if the operation be controlled by any sort of common sense. We do not hesitate to use arsenic or nux vomica, aconit, argenti nitras, cocain, and scores of other poisonous drugs. We can have the action of the acid under perfect control. I always keep a saturated solution of bicarbonate soda on the case, so that I may stop the action of the acid at any moment. In but few cases is it probable that the acid will go through the apical foramen in quantities or strength sufficient to have any corrosive effect, because neutralizing agents in the dentine will have materially weakened the acid before it can pass through the extremely small opening at the apex of the root. If there be an abscess present, the foramen is likely to be larger, and the condition of the tissues about the apex of the root will be materially benefited by the presence of the acid, even if in the full strength of the solution. In my mind there could be no better agent for the breaking down of the diseased tissues and the positive destruction of all germ life. A case in practice will probably illustrate the point I wish to develop : A lady, aged 25 or 30 years, who had been under surgical treatment for a large fistula at the symphysis of the chin, came to me at the request of the surgeon for examination, and treatment if I thought the case demanded it. By the aid of the electric light I located the trouble in the two lower central incisors ; the pulp chambers in both teeth were opened ; the canal in each tooth was so small they were practically closed ; a drop of the acid solution was placed in the pulp chambers, and with a No. 5 Donaldson Root Canal Cleanser was pumped into the canals ; in a few minutes the instrument found its way through the root ; the canals were then enlarged by using larger broaches, thereby establishing direct communication from the pulp chamber through the seat of the abscess and throngh the whole length of the fistula. Several drops of the solution were then pumped through the roots into the fistula, and made their escape through the opening at the symphysis. On the second day it was given the usual antiseptic dressing ; on the

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*Good results may be obtained by the use of weaker solutions, but my desire to present a ten minute paper prohibits the mentioning of many details.

fourth day the roots and fistula were thoroughly filled with chloro-percha, and kept under observation for a few days. No signs of inflammation appearing, the patient was dismissed as cured. I do not believe the roots could have been opened in a reasonable time by any other method, and I believe that the acid was the best remedial agent that could have been applied at that stage of the treatment. The acid at first attacks the tooth substance vigorously, breaking up the lime salts and corroding or changing the form of the organic substance and forming a new compound, thereby establishing a barrier to the further progress of the acid. Professor J. S. Cassidy, in his valuable text-book, "Dental Chemistry and Materia Medica," page 77, says: "Sulfuric acid attacks the earthy portion, forming insoluble calcium sulfate (Ca SO) and at the same time dehydrating the animal or gelatinous portion, which is mainly made up of carbon, hydrogen and oxygen; these two latter elements are withdrawn as already alluded to, leaving the indestructible carbon as a residue, to be incorporated with the insoluble sulfate, producing thus a protecting covering to the unaffected parts beneath against further inroads." —*Items of Interest.*

AMALGAM *VERSUS* GOLD.

BY DR. GEORGE A. MILLS, NEW YORK.

We judge that, after forty-two years of more than ordinary interest in dental practice, we are prepared to express our thoughts upon this subject. Those who know us will give credit for following what we believe to be our convictions. No one has more earnestly or more faithfully advocated the importance of our calling, and it is because of the increased value of its importance that we propose to put ourselves on record regarding a duty towards those that as sincerely seek at our hands the services they need, as we all sincerely desire to give these services. If dental practice means more one thing than another, the emphasis should be put upon the thought of saving teeth in as large a percentage as possible, and this with the smallest expenditure of time, money, and nervous force. We are prepared to say that the last thirty years has a large account against us, and we think that the next thirty should be as devotedly used for the cancelling of this account. It is only necessary to hint at the experience of all earnest operators who have followed close upon us during this term of years. To say it has been a burden of great expense to us all, both patient and operator, is only saying what all know to be true.

Truly it can be characterized as the Golden Age. It has been said

by some to have been the "Gold craze." No, not a craze in any sense, but as sincere a desire as ever possessed any class of men to perform their whole duty. The use of gold for filling teeth has been carried to its fullest extreme. Atkinson, Varney, Webb, and Brown will stand among the notables in this line of service. They have shown us the perfection with which this metal can be handled, even to the ideal, both in its thoroughness of compact and its correspondence to Nature's forms and contact, giving back to the possessor of the sadly deformed masticating apparatus as comfortable and useful a reconstruction as it is possible for a man to devise with this material upon Nature's foundations.

Have they done all this amiss? Certainly not. They have acted up to their best light considering the human entanglements that have involved their career. We allude to this that it may not be said, with any effective force, "I told you so." We are not in sympathy at all with the weak and unwise criticism, even if it can be called criticism, that has come from not a few worthy men regarding the handiwork of these extreme and skilful operators. Every one of them has emphasized excellence, which has a decided bearing upon all the service that we are called upon to render. Everything that is worth doing commands our best attention, and let it be understood that we have in mind only those who have a conscientious desire for the good of those who place themselves under their care. Let us ask a question that will appeal to all upright practitioners. Have you not frequently been brought face to face—in view of a lamentable failure—with this thought? Would I not, in view of what I now see, and in case I could retrace my steps, change my dealing with a hope of far different results, and give to my patient a service much larger in proportion? How many of us are always manly enough to meet such a demand squarely and fairly, and say, I have learned a lesson that shall stand for all time? These experiences do, more or less, influence our course, but none of us who are really skilful come down easily. Humility is not a crowning virtue. It is only when a bold stroke comes like that applied by our genial Foster Flagg that we become reflective, and not then while under the first effect of the lash.

Since that time we have had opportunity to reflect; and we have reflected, and to all men of judgment this has brought about a decidedly eclectic procedure, and a larger range of conservative practice; while, on the other hand, it has afforded an occasion for others to cater unwisely to the weaknesses of a clientele of the so-called *elite,* which has not proved economical in time, money, or saving of teeth. These things are so well understood by observing men

that we need only refer to the fact. It is not necessary to recapitulate what is well known by all readers of our journals,—that the "causes of failure in filling teeth" has become a hackneyed topic, without really touching the principles that lead to these prolific failures that are occurring on all hands to a greater or less degree. True, we are under human limitations, but to say that we have reached the largest possibilities in saving teeth, even with the knowledge in our hands, is not squaring ourselves to the facts.

At this stage of our article we are prepared to say intelligently, and without any fear of the contrary being proved, that we have in our hands both knowledge and an ally that will enable us to so change our practice that we can increase the salvatory service—which is so much needed—in a very large percentage above what we have previously been able to do. We do not advocate the practice that we are aiming at in this article because of the inability of the many to save teeth during long terms of years, but it is because we are facing well-considered convictions that we can do all this and much more with far less expense to all parties concerned.

One of the most painstaking operators in Brooklyn, and none more skilful, said lately, showing some very elaborate fillings in the molars and bicuspids made under great difficulties, but successful now for a period of twenty-three years, "To day I would not repeat such an effort. I can do as well with a great reduction of cost." Said he, "I put my very life into that work, and no man can ever hope to be paid a fair compensation for such service."

No one, for a moment, would hesitate to laud the discovery of a gold plastic for filling, but what will many say when the fact is stated that we have a plastic metal filling that will meet the larger demands with a greater percentage of success directly at hand? Does some one say now, with bated breath, that we are to be faced with the advocacy of the so-called "Amalgam *versus* Gold"? Yes, for we have never made an effort with firmer purpose than this or more faith that it will result in fruitage. We know intuitively that many are occupying their thought in the same direction. This reform of our practice is a foregone conclusion, and the way to bring it about is to openly advocate it.

Let it be understood that we frankly and understandingly declare it to be our discriminating belief that amalgam, as it is offered to us to-day, has in it the largest possibilities of any of the other materials. We hardly need to call attention to the former objections so far as discoloring, for this material is now free from that defect. The

shrinking and bulging is not worthy of intelligent attention, and so far as the objection made to its deleterious effect upon the system, it stands "not proven."

Now that we have unmasked our purpose, we will endeavor to lead the attention to the fact that must enlist the emphasis upon two essential additional points of practice, in order that our statements may be proved to the fullest extent. Nothing but real ability will bring the largest amount of success. The first of these essential points is the securing of the best possible sanitary conditions. Antiseptic lotions and tooth-brushes, and here and there atomizing of a numberless variety of medicaments, will not meet the demands of a majority of cases. Nothing but a radical intelligent dealing will be efficacious. Having secured this, we have reduced the exciting cause of caries to a minimum.

Now we are prepared for the next essential step,—*i.e.*, the preparation of the tooth for receiving the filling-material. I only advocate what others have done, bestow the same care and thoroughness in the one case as in the other. When practitioners have more largely devoted their faithful attention to these all-essential points, we will then have far less cause to discuss why our fillings fail. Carry out these teachings, and they will do more to aid the over-worked practitioner and bring from our patients such plaudits of praise as we have never conceived. If you believe from your heart, through your head, that the declaration of this is true, there will be but little difficulty in carrying it into practice. If the truth of this article is recognized, many must inevitably adopt it.

We will close by prophesying that gold will have to give way to amalgam and acknowledge its superiority. Nothing stands in the way of its rightful position but prejudiced thought formed by ignorance and past associations. We have done much in the filling of teeth in past days along all the most advanced lines.

Our practice has so changed during the last fifteen years that we have been largely spared the laborious work of dealing with extensive and difficult operations in filling. Our surgical work has largely taken the place of this line of service. We are content to believe that we are much relieved from the arduous labor of this branch of practice. We have done many things under the conviction that we were advocating for the good of our fellows, and none more so than this. That we may have the best material possible, we hail it a favorable omen that Dr. Morgan Howe has called the attention of the Odonotological Society of New York to the great need of taking steps for securing the best formulæ for amalgam, and this by the employ-

ment of expert scientific ability, outside the profession if required. The day will come when we will acknowledge our indebtedness to Dr. Clowes, of New York, for his abiding faith in the ultimate recognition of the value of amalgam. He has stood steadfast even to date, and there has been no more honest or able advocate, and all his practice has had the stamp of integrity upon it. It is very largely because amalgam has been made a substitute that it has had very indifferent consideration so far as associating skill with its use.

We are not declaring that gold is not to have any place as a filling-material, but we do declare that it cannot be made to serve the purpose of saving the greater number of teeth that most need saving. We have emphasized the importance of securing for the teeth the best possible sanitary conditions, and the most skilful preparation for filling, and we add to this the same painstaking in finishing as we give to our most elaborate gold fillings. Then impress our patients with the responsibility that rests upon them for their proper care. We have for many years advocated that indifference to sanitary conditions stood against the mass of practitioners as the flagrant cause of failure of fillings, and we can truthfully say that to this must be added indifferent attention to the care of the teeth attacked by caries. To be sure, we cannot guarantee against more or less deformation occurring, though we do our best. There is a larger helpfulness of an advance in a salvatory service if these views here given shall be put into practical use, and we are also sure that our patients will be ready to accept the purpose of our earnest and intelligent service.

A FEW EXCELLENT ITEMS.

DR. J. W. GREENE, TRENTON, MO.

Comparatively few dentists can work gold properly in filling teeth —all agree to that. Yet it is really a fact that still fewer can uniformily make the best of oxiphosphate. I frequently see cement fillings of my competitors, as well as my own, that have stood the test from ten to fifteen years, even in frail teeth. They happened to be mixed and inserted right. Yet other work of the same material, by the same hands, at the same time, in the same mouths, has given out long ago. In these the material was improperly mixed or the work otherwise faultily done, or both—more probably the former.

Why do the "best men" advise to fill cavities two-thirds and three-fourths full of soft gold and then finish out with cohesive? Don't they know that cement is the best thing to use in the bottom of cavities? (And in a whisper we might say: In the top, too, if mixed

just right.) If dentists would make as much effort to learn what they don't know, from their competitors, as they do to make themselves believe they know the most, what a valuable stock of knowledge some of them could get "without money and without price."

The "foolishest" thing a dentist can do is to put in artificial teeth cheaply. Learn to select harmonious styles, natural colors, and arrange them artistically in the mouth; then make fits that your competitors cannot, especially in lower sets, and you can get good fees

If a full lower plate, foolishly called a "denture," has no suction at all, just admit its lack of fit and do it over; and if you don't know how to make it suck fast, learn how.

All that part of an amalgam filling which comes in contact with the walls of a cavity should be burnished in. And to properly mix the amalgam it should be well kneaded in alcohol. Such kneading will reduce its bulk at least 20 per cent, and of course solidify the filling that much, by disposing of the surplus mercury readily.

About the most expensive luxuries that a dentist can indulge in are: A dingy, dirty office; unpolished and rusty instruments; rough hands and unkept nails, and shabby clothing. If he is a poor man he can't afford them.

The "guarantee" that should accompany every full or half set of teeth should be that the patient can chew even the toughest dried beef, "on the spot," without displacing the plates, before she leaves the chair or pays for her work. And then and there she must be made to understand there is to be no grumbling afterward, and no further "warrant."

There are three steps in the evolution of the air chamber business: First, to stamp it in with lead or tin, instead of the bungling way of engraving the impression; second, not to put it in the front of the mouth, but well back, with its edges beveled so as not to irritate the membrane; third, to truly regard it as an excuse for a poor fit and leave it out entirely.

Dr. D. W. Walker is correct in filling broken down front teeth with amalgam and then removing the front part that shows for the insertion of gold. I do the same when I use cement. In this way the lingual walls of frail front teeth can be nicely squared out permanently to feel good to the tongue. It may appear silly to some dentists to say that there is not only more honesty, but more money, in this sort of work, than in riding the silly exclusive gold hobby.—*Items of Interest.*

DENTAL SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

At the thirtieth annual meeting of the Illinois State Dental Society, held at Springfield, May 8-11, 1894, the following officers were elected for the ensuing year:

J. W. Cormany, Mt. Carroll, President; S. F. Duncan, Joliet, Vice-President; Louis Ottofy, Chicago, Secretary; W. A. Stevens, Chicago, Treasurer; Grafton Monroe, Springfield, Librarian. The next meeting will be held at Galesburg, May 14-17, 1895.

LOUIS OTTOFY, Secretary, Masonic Temple, Chicago.

THE PRACTICAL PLACE.

KILLING AN ABSCESS.

Dr. J. D. Adair describes the method of using the kalium natrium (potassium-sodium) preparatlon of Dr. Emil Schrier, and reports very satisfactory results in a number of cases. In one case he had vainly treated for six or eight weeks abscesses of three superior incisors, which were to receive crowns. As the young lady had to return to her home in Baltimore, he concluded to make an application of the preparation and fill the roots without further delay. There was still pericemental tenderness with pus constantly present. The crowns were put on at the final sitting. It was five months before he heard from the case and then he was greatly rejoiced to learn that the abscesses had given no further trouble and that the teeth were in every way comfortable.

It is now ten months since the crowns were put on and they are still perfectly satisfactory, having been heard from several times during the past five months.—*Exchange.*

REMOVAL OF DEVITALIZED PULP.

After removal of arsenic, wipe out with a fresh solution of dyalized iron, and place in the cavity a small pellet of cotton saturated with a saturated solution of tannin in glycerine; seal it with gutta-percha. After ten days the pulp may be removed whole without pain apu without hemorrhage.—*H. H. Silliman.*

IN PERIODONTITIS.

Instead of painting the gums in a solution of aconite and iodine, Dr. Jones injects it under the gums close to the alveolar margin. The effect, he claims, is instantaneous.—*Zahntechniche Reform.*

C. N. Peirce, on an Obtundant for Sensitive Dentine.

As a satisfactory "obtundent" for sensitive dentine is very desirable, I send you herein a formula which has responded more frequently in desired results than any other combination I have used, not excepting my experiments with the secret nostrums sold for the purpose. While this in preparation costs less than one-fourth of those, I have the satisfaction of knowing the constituents, and would advise those who desire an obtundant for this purpose to try this combination before purchasing any secret product.

℞ Cocain,...gr. v.
Carbolic acid..grs. xx.
Chloroform..℥ ss.
Muriatic acid..m x.
Alcohol...℥ ii.

—*International.*

Trichloracetic Acid is invaluable in the removal of the gum when it has grown over the edge of a cavity, placing the rubber dam on before the operation. Sometimes when cutting away the gum there is considerable loss of blood, but the application of tr chloracetic acid will enable you to remove it without hemorrhage. After the filling is completed, and examined a day or two subsequently, there will be found a healthy condition of the gum, the parts that were burned having sloughed off and healthy action taken place.—*International.*

A Substitute for Copper Amalgam.

For filling children's teeth, for filling fissures in soft or imperfectly calcified teeth, such as Dr. Perry refers to, page 155, current volume of this journal, and in all cases where from any cause it is desired to use a very plastic amalgam, I have been using for a year or more, with much satisfaction, a heavily silvered alloy, sixty parts of silver to forty parts of tin, using with it sufficient mercury to produce the desired plasticity. If made as recommended by Dr. Flagg, in his excellent work upon "Plastic Fillings," and the alloy cut up with a fine file, or, as I prefer, reduced to delicate mat surfaced shavings in a turning lathe, a thorough trituration produces a soft plastic mix that with but little pressure is readily and quickly adapted to the cavity by patting with a lock of cotton. It sets very promptly, and makes for these cases a fairly satisfactory filling. It must be borne in mind, however, that an extra amount of mercury favors shrinkage and impairs edge strength, but with heavily silvered alloys to a far less degree than with alloys containing a larger percentage of tin. It

takes the place of, and is much to be preferred to copper amalgam. It retains its full plasticity but a few minutes only, and must, therefore, be used quickly.—WILLIAM H. TRUEMAN, D.D S , Philadelphia, in *International.*

SELF-RELIANT.

It has been said that Mr. Boucicault was conceited. A gentleman tells me he once asked an actor what Mr. Boucicault believed in, and the actor replied: "He believes first, last, and all the time in Mr. Boucicault." That was true, and I am glad that it was true. His belief in his own powers was one of the secrets of his success. And it may be said that all men of any intellectual stamina believe in themselves—the world calls it conceit, but it is really the spirit of self-reliance which gives them the nerve to accomplish what they undertake. I do not believe there has ever lived a great man who has not plainly shown that he believed in himself.

THE following is recommended for those who desire soft, white hands:

℞	Lanolin	30 parts.
	Glycerin	20 parts.
	Borate of Soda	10 parts.
	Oil of Eucalyptus	2 parts.
	Essence of Bitter Almonds	25 drops.

M. Sig. Rub hands with preparation and cover with gloves at night.—*L'Odontalogie.*

WATCH OR CLOCK OIL.

Take of prime salad or table oil, in a bottle, say, one pint. Lead, in sheet form, one-sixteenth of an inch thick, or less, from which cut strips a little shorter than the bottle, to form a bundle about as large as the bottle's neck. Place the strips in the bottle, cork lightly, and hang in a window, giving it the greatest amount of light and sunshine possible. In a few days the oil will become clouded; and later a grayish substance will settle, showing a separation of oil and vegetable matter. The supernatant liquid will remain clear and free from odor. For lathe, dental engine and hand-piece, it is a lubricant *par excellence.—A. C. Hewett.*

IT seems to me good, reasonable, and logical doctrine that we should refuse to fill roots immediately in all cases of septic condition.

We should only choose those roots for immediate root filing in which we are satisfied the condition is aseptic, and has been none other than aseptic.—*G. V. Black.*

E. T. Darby, on Cohesive Tin.

Tin may be worked in various forms. When the cohesive properties are to be relied upon, there is perhaps no better method than rolling the foil into a loose rope, and cutting into pieces of various lengths. In cavities surrounded by strong walls, the tin may be folded into tape or made into cylinders, and time will be saved by introducing it into the cavity. Shavings of tin turned from a revolving ingot of the metal in the lathe work with a softness which makes it a pleasure to use it.

I have only a word to say about tin shavings, and the tin wheel from which they are turned.

An ordinary corundum wheel, one-half inch thick and two inches in diameter, is used as a model, and is molded in sand. The tin is melted in a ladle and poured into the sand, after which a hole is drilled in the centre of it, so that it can be mounted on an arbor and turned in the lathe. A chisel on the side rest is used as the tool, and these shavings are turned off the thickness desired.

Pure tin freshly cut from the wheel in the form of shavings is quite cohesive, and as you have seen, packs beautifully.

When tin and gold are combined in the same filling, I think there should be at least two leaves of gold to one of tin. My habit is to put one leaf of No. 4 tin between two leaves of No. 5 soft gold foil, then fold it and cut into narrow pieces.

I am not particular what kind of an instrument I use to pack the tin with. An ordinary excavator with the point dulled or broken is as good as anything. The tin is so cohesive that it works as well as cohesive gold foil.—*Ohio Dental Journal.*

D. W. Barker, on Finishing Strips.

I have brought with me some of the material I am in the habit of using for finishing off the approximal surfaces of amalgam fillings when they are first inserted. It is very thin copper; in fact, it is so very thin that to give it additional strength I double it. I have prepared a quantity of the strips as I use them, and those who wish may take one or two, to try them. After slight use, these strips become covered with little deposits of amalgam and mercury, and are soon useless; but they give a very beautiful finish to the approximal sur-

face of amalgam fillings. This material is sold under the name ot copper tinsel. It has upon it a sort of gelatin mixture, with coloring matter in it which can be readily removed with boiling water, and a bright surface is left. It can be obtained at almost any hardware store.—*Cosmos.*

Local Anesthetic for Painless Extraction of Teeth.

Dr. J. Alberto del Solar, Santiago, Chile, has furnished us for publication the following formula for his local anesthetic to be used in his painless extraction of teeth :

℞ Alcohol, 98 per cent.........................f. ℥ ij.
Chloroform.................................f. ℥ iv.
Ether, sulf.....................................f. ℥ iss.
Camphor.......................................℥ j.

M. The solution thus made is to be applied to the gum for one minute, both buccally and lingually. It is not intended for hypodermic use, and to secure the best result the gum should be carefully dried before making the application.

Jas. Truman, on Making Gold Fillings for Children from Eleven to Sixteen Years of Age.

I am almost prepared to assert that it is malpractice for any individual to place gold fillings in children's teeth from eleven to sixteen years of age. I know that it is a strong statement, and perhaps I should qualify it to some extent by the assertion that some teeth will bear it ; but we cannot reason upon exceptional teeth. The teeth that are sufficiently dense at that age to bear such fillings are extremely rare.

What is the philosophy of this ? You all comprehend the fact that a tooth at this age of life is not fully developed. That all the tubuli, histologically speaking, are very much larger than they will be at a later period ; and if you place a good conductor in the teeth, as gold, irritation will be produced, and the irritation upon the peripheral ends of the tubes will be carried to the pulp, producing inflammation and final destruction. If this be the case (and I cannot see that it is possible for any one to deny it, knowing the minute anatomy of the tooth structure), are we justified in ever using gold in that class of teeth ? I have, therefore, declined to use gold up to the twentieth year, except in rare cases, notwithstanding the frequent objection of parents. If parents are permitted to dictate to us, we have mistaken our calling. I have had some such difficulty, but I always say, You

must accept my word in the matter or it would be better to take the child elsewhere. This I regard as the only course to pursue in these cases until greater density is secured. The expression that "whatever tooth was worth filling was worth filling with gold" has lost its force, and we are coming down to a philosophical method of treating teeth,—not alone those of children, but all teeth.—*International.*

A Hungarian chemist, Dr. Johann Antal, recently reported to the Hungarian Society of Physicians that he has discovered a new chemical compound, the nitrate of cobalt, which, he says, is a most efficacious antidote to poisoning by cyanide of potassium or prussic acid. He tried the antidote first on animals, and afterwards on forty living persons who had been accidentally poisoned with prussic acid. In not a single case did the antidote prove a failure.—*London Public Opinion.*

According to a German scientific journal, a material called "flexible glass" is made by dissolving four to eight parts of gun-cotton in one part of ether or alcohol, and adding to the solution two to four parts of a non-resinous oil, and four to ten parts of Canada balsam. The mixture is spread on a plate of glass and dried in a current of air at a temperature of 50 degrees. The residuum is a hard, flexible, transparent mass, resisting alike acids, alkalines and salts.

Epsom Salts for the Pain in Burns.

On the morning of December 5th, 1893, we were called to see Mr. W. S. Huff. We found him with the palmer surface of both hands and fingers burned to a blister. His wife's dress had caught fire and he burned his hands extinguishing the flames. When we saw him he had his hands in a bowel of water, syrup and soap, and was suffering intensely.

We gave him one-third grain of morphine and dressed the hands with lime-water and oil mixed. The pain continued, and at the end of thirty minutes we administered another dose of morphin; but there was no relief—the suffering seemed to increase. His skin became cold and was covered with perspiration, and his agony was so extreme we feared lock-jaw. In this emergency we decided to try a remedy my wife used with success in a burn twenty-five years ago. We dissolved one pound of epsom salts in two quarts of water, and immersed the hands of Mr. H. in this solution. Almost instantly he was free from pain. He was now so comfortable—talking and

laughing with friends—that it was not easy to realize that he was the same man who was in so much distress a few moments before. We let the hands remain in the preparation one hour.

When they were put in the solution they were red, swollen, hot and painful. When taken out, these symptoms were about gone. Yet the remedy was so simple and safe.

The hands were dressed as before—with lime-water and oil mixed—dusting oxide of zinc on the raw spots where the skin was off. The hands were soon well with this light dressing.

In one hour from the time the hands were removed from the solution and dressed, Mr. H. was at the court house attending to business.—N. F. Howard, M.D., Dahlonega, Ga., in *Med. and Sur. Journal*

Cocaine and Boracic Acid.

A ten per cent. of hydrochlorate of cocaine, in a saturated solution of boracic acid, will be found valuable for applying to the gums previous to using clamps or ligatures of silk.

That fresh pipe clay will stick to the lips very readily, is within the knowledge of most; and there seems no reason why pipe clay disks should not be placed over the orifice of Steno's duct, and so aid us in controlling the flow of saliva.—*British Journal.*

The Natural Method.

God made certain individuals stronger than others. I maintain, however, that man has it in his power to improve his physical condition. Man, I use in the general sense. I include in this category every man, woman and child the sun shines upon.

The best way to acquire physical powers is to throw physic to the dogs and maintain a strict observance of nature's laws. Eat and drink whatever the system craves, only don't go into excesses. Nature will tell you, as she tells the beasts of the forest—for, after all, man is only an animal of the higher type—what your system needs. The lion and tiger are carnivorous animals and will take only meat. An elephant or a horse disdains meat and will partake only of hay, oats, bran and the like. A cow will chew grass and a squirrel crack nuts, or acorns.

So with man. Nature tells him what he requires. What is one man's meat is another man's poison. You can take chops, sweet-

meats cereals and cordials, because you are emaciated and your system demands them. I am strong and heavy, and therefore sirloins and hard cider suit me better. I do not need flesh ; you do.

So much for diet. Now for action. Exercise moderately and persistently. Do not follow any set rules, but be guided by your own natural inclinations. Walk, run, jump, row, wrestle, box, swing clubs or dumb-bells as best suits your gifts. Do not go, however, too far in any one branch. Give them all a trial, but follow the one branch of sport to which you yourself can easily perceive you are best adapted. If you vary the routine you will strengthen every muscle of the body and stimulate the vital organs.

Above all things, never overtax your powers. Do not through a spirit of emulation, strive to equal friend or foe in a gymnastic feat which he has accomplished with apparent ease. He may have mastered the trick and you have not. Besides, the particular muscles which aid in the performance of the feat may be better developed in him than in you. A serious strain may do you more harm than all of your previous inertia.

Study the problem of health and strength, then, as you would a profession. Study yourself. Nature will tell you your physical limitations. Exercise, then, mildly, constantly and judiciously, both inside and outside. Quit when you are tired and refresh yourself with a shower bath and good rubdown. If you follow these rules I will bet a dollar to a doughnut that your physical condition will soon be improved in every way.—Attila.

New Solder for Aluminum.

Aluminum is soldered with the alloy given below, with the ordinary tinman's soldering-iron, or with the blowpipe. It does not oxidize or discolor the metal. The following solders are employed for aluminum :—No. 1—Pure tin ; melts at 250°. No. 2—Pure tin 1,000 parts, fine lead 50 parts ; melts at from 280° to 300°. No. 3—Pure tin 1,000 parts, pure zinc 50 parts ; melts at from 280° to 300°. These three solders may be used in the manufacture of aluminum trinkets. For the following two solders the soldering-iron should be made of pure nickel. No. 4—Pure tin 1,000 parts, pure copper 10 to 15 parts ; melts at from 350° to 450°. No. 5—Pure tin 1,000 parts, pure nickel 15 parts ; melts at from 350° to 450°. No. 6—Pure tin 900 parts, pure copper 100 parts, bismuth 2 to 3 parts ; melts at from 350° to 450°, and is recommended for soldering aluminum bronze.—J. Novel, *Chem. News.*

JOHN C. LUND,

Died July 10, 1894.

It becomes our sad duty to announce the death from rheumatic fever, on July 10th, of Mr. John Conard Lund, who for thirty-four years had been engaged in the Dental Supply business, travelling through New York aad Pennsylvania, and representing the interests of the publishers of this journal, with whom he was connected by the bond of kinship, being the brother of Mr. Oliver Lund. Mr. Lund was born in Cecil County, Maryland, Dec. 27th, 1842, and was a grandson of Judge John Conard, who in his time served this city on the bench, and represented the northern portion of Philadelphia in Congress during the war of 1812.

Mr. Lund came to Philadelphia in his youth, and began his connection with the Dental trade in 1860, when he travelled in the West for his brother's firm. A short time after he succeeded Mr. Monroe Frank, now of Chicago, Ills., in the route through New York and Northern Pennsylvania, in which he remained until his death. He was unmarried and lived with his mother and sisters in Germantown, this city, until his mother's death, which preceded his own but two months.

His kindly winning manner made him many warm friends, and he enjoyed a wide popularity, both in and out of his business. He was a devoted son, and had but shortly grieved a broken home. His desk stands sadly vacant in the office of the publishers, who mourn a friend and brother's loss.

THE

Dental Office and Laboratory.

FOURTH SERIES.

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THE UNKNOWN CONCERNING AMALGAMS FOR FILLING TEETH.

By William H. Trueman, D.D.S., Philadelphia.

Although three-fourths of a century or more has passed since mercury, in combination with other metals, was first used as a filling for cavities in carious teeth, there is not, so far as my knowledge of dental literature extends, any record by which a student can obtain exact information of the part taken by the various metals combined with it in dental amalgams. In all probability mercury was first used to reduce the fusing point of the lead, tin and bismuth, alloys that found acceptance for this purpose in the almost forgotten past. It is also probable that this use of mercury suggests amalgam. The absence of dental journals, and the trade jealousy then existing, has made historic studies of methods of practice, of that early period, difficult and unsatisfactory. At the present time, the composition and process of manufacture of by far the larger portion of these compounds are trade secrets. The results of experiments, many of them no doubt carefully conducted and of much scientific value, in the light of which the various manufacturers of dental alloys have constructed their formulas, are for the most part held as private property, and are therefore inaccessible for the purpose of study. While this is to be regretted that it is so, I am strongly impressed, the profession has no just cause to complain, and possibly it has really lost less than the simple statement of this fact might seem to imply. The profession has not been at all times any too ready to give due credit to patient investigators who have freely given the results of their labors. There is too much of that spirit, which while ever ready to grasp and to appropriate a good or useful idea, considers any effort to give due credit to its originator, time and labor wasted. The effect of this is well illustrated in the history of dental amalgam. The first real improvement in its composition, at least in this country, was communicated to the profession by Dr. William M. Hunter, of Cincinnati, Ohio, who is best remembered as a joint laborer with Dr. John Allen

in the invention of continuous gum dentures. In the course of a communication to the Dental News Letter, Vol. ix, page 35 (October, 1835), Dr. Elisha Townsend notes approvingly, giving due credit to its originator, the formula suggested by Dr. Hunter, four parts silver to five parts tin. Dr. Townsend's name, in connection with amalgam, through his having so earnestly advocated rescinding the amalgam pledge, was at that time prominently before the profession; simply for trade purposes, the manufacturers took advantage of this to give his name to this formula, and to the product made by it. His death so soon after had, no doubt, much to do with its being so tenaciously retained. Dr. Townsend never took kindly to amalgam as a tooth filling material, and always, except as a last resort, discouraged its use.

The inventor of the next improvement acted more wisely (shall we say it? Is that the word? Shall we say "wisely?") He kept the secret to himself, manufactured and sold the improved alloy, and the profession, *which so sternly set its face against any such conduct as that, rewarded him with undying fame and an ample fortune!!* Those who have followed the example of Dr. Lawrence have, for the most part, reaped a like harvest. Dr. Hunter followed strictly the lines laid down by professional ethics, and has been almost forgotten, and the credit so justly his, has been by the profession he benefited, conferred on another, who neither merited or desired it.

Ever and anon, we catch a glimpse in dental and collateral literature of the use, at an early period, of amalgams for tooth preservation. The characteristic component, however, being under the ban, it is by early dental writers, with singular uniformity, mentioned only to be condemned. A careful search would, no doubt, ferret out much of its history at present unknown. Such an enquiry, interpreting the records in the light of the present, so as to separate the fancied from the real ills attending its use, would be a real and important addition to our knowledge of dental amalgam.

I am not unmindful of the data to be found in the various text books, nor yet of the numerous contributions in the dental and other periodicals, concerning the metallurgy and chemistry of amalgams, and yet I feel free to say that the investigator, studying the subject from a dental standpoint, will find an open field. There is little indeed concerning dental amalgams, that we may consider settled Reputed authorities differ so widely and so radically upon material points that their statements are about as satisfactory as pivoted signboards swinging round with the wind. A great deal of thought and time has been expended, but so far as the records show there has been

much more "pottering round in the dark" than careful scientific research. I would suggest the importance of careful investigation in a systematic manner, of the binary amalgams and the binary alloys, in connection with those more complicated, with a view to settle beyond the question of a doubt the part each metal plays by itself and in combination. This is no simple task; the labor will be enormous; its value will depend upon the care and skill brought to bear upon it. So conduct and record the investigation, however, that it will be helpful to those who may follow, and your labor will not be in vain. Heretofore the effort has been to compound an acceptable amalgam, and the work leading thereto has been largely lost. The final result of these labors, an acceptable amalgam, being so largely controlled by "personal equation," adds but little to our general knowledge. The results of analysis of various brands of alloy on the market, which have from time to time been acceptable to, and approved by skillful operators, are perplexing to one scientifically inclined. If the formula, deducted from analysis as given in the text books, are correct, a pair of scales seems a needless refinement in compounding an acceptable amalgam,—it will, indeed, be difficult within wide limits to make an alloy, without striking some one of these appointed and highly recommended formulas.

The method and order in which the metals are united to form the alloy, and the preparation of the alloy for amalgamation is also a subject for investigation. The authorities differ widely regarding this, and yet, surely, there must be in this, as in other operations, a right way and a wrong way, or at least a *best* way. We have here also a free field. While the art of making alloys has been long and carefully studied from its business and scientific standpoint, and the best way of making alloys, of all kinds and character, can be gathered from either personal or published experiences, reliable and trustworthy, we find that the method is to a great extent modified by the intended use to be made of the finished product. Very few, if any, of the alloys used in the arts and manufactures, except dental, are compounded with a view to their subsequent preparation and use as are those required by our specialty. So far as I know, but little attention has been paid to this; we hear now and again very positive statements regarding its importance, the vast difference the manipulations of the furnace makes in the alloy, etc., but all these matters are held as trade secrets, but little information is divulged, we are at times led to understand that there is in this a great deal of "personal equation;" it is not so much the method as the expertness of the workman, that it results from natural aptness and constant practice, that

it is a skill very like that of the expert in tempering steel, that cannot be explained scientifically.

The ideal alloy, an alloy that will produce the best results in each and every case is perhaps unattainable. The requirements for differing cases are so different that an alloy producing an amalgam plastic enough to be satisfactorily manipulated in one case can hardly be expected to be at its best in a case that calls for diametrically opposite conditions. We have here again an important question to answer, and, I think, a free field in which to work. For a few alloys the best proportion of alloy and mercury have been approximately ascertained. This is, however, a partial answer only to an important question. We require to know not only the best proportion, but the limits on either side between which may be a permissible deviation from the best without essential impairment of usefulness. We require also to know the character of impairment when this permissible limit has been passed. Does it impair hardness, stability of shape, or form or favor an objectionable change of color? Very complex indeed, and very important, practically considered, is this question. Consider for a moment what takes place while filling a difficult or inaccessible cavity. It is no uncommon practice and a convenient one, in such cases, to use first a portion of amalgam very soft and plastic, one containing an excess of mercury, to pack this in place and to so manipulate it that the excess of mercury is pressed out and removed. To this is added a portion containing less mercury, intending that this shall, by absorbtion, remove another portion of the excess in that first used. You are all familiar with the manipulations, and can readily see the practical bearing of the question. If the alloy permits a slight excess of mercury only without serious impairment of strength, if it slowly and imperfectly gives up the excess under manipulation, we can readily see that in a case like this we are considering, we will fail to produce a perfectly homogeneous filling. The body of the filling will be satisfactorily hard, but the deeper portions, those which fill the retaining grooves and the little irregularities upon which we depend for retention, retain the excess of mercury and fail to acquire sufficient strength, in many cases, from this cause, failure will be the inevitable result. Experience has demonstrated time and time again, indeed, it is an admitted fact, that different alloys differ widely in this respect. Upon what these differences depends, is, so far as I know at present, unexplained.

Expansion and contraction figures largely in all discussions upon dental amalgam, and yet how little we really know about it. This formula produces an alloy that when amalgamated contracts; that,

one which expands ; and the other one which remains neutral. The text book say so, of the why and the wherefore, when the change in bulk takes place, and its extent, and how long this unstable condition continues, etc., they one and all fail to give a satisfactory answer. Whether there is or is not some as yet undiscovered law governing these matters, whether there is or is not some isomerical line running through the various combinations is an important subject for investigation. Concerning some metals very remarkable facts have been established regarding their behaviour with other metals. Take for instance the case of aluminum ; it seems to have been satisfactorily settled that ten per cent. is the limit of its usefulness as an alloy, and on the other hand it is a useful addition to other affiniating metals to the same extent only. This seems to be true of an alloy of which aluminium is a component.

The color question is also a very unsettled one. It is true that there is at present on the market many alloys which, when formed into fillings, retain their color to a very satisfactory degree ; indeed, the uncertainty of an amalgam filling retaining its color has largely ceased to exist. There seems to be an impression, however, that to secure a satisfactory color we must compromise some other desirable condition, and yet, who can say with any degree of certainty upon what particular feature or features integrity of color depends. And again, is there any ready method by which we can quickly determine with certainty the probable behaviour of a filling in this respect?

I might continue to enlarge this list of the unknown concerning dental amalgams ; my purpose has been, however, to simply suggest the lines upon which the investigation of the amalgam question this Society proposes to make may be profitably pursued without touching upon ground already covered.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE 19th annual meeting was held at Geneva, August 6-8. The following officers were elected for the ensuing year :—President, Dr. Charles W. Jenkins, Zurich ; Vice-President, Dr. Wm. Mitchell, London ; Treasurer, Dr. Chas. J. Monk, Wiesbaden ; Secretary, Dr. Wm. S. Davenport, Paris ; Executive Committee, Dr. Jenkins, Dr. G. C. Daboll, and Dr. A. C. Hugenschmidt, of Paris ; Membership Committee, Dr. Mitchell, Dr. L. C. Bryan, of Basel ; Dr. Waldo Royce, of Tunbridge Wells.

The next meeting will be held at Boulogne, the first Monday in August, 1895. WM. S. DAVENPORT, Secretary.

[TWENTIETH PAPER]

LEADING QUESTIONS AND ANSWERS FOR DENTAL STUDENTS.

BY THEODORE F. CHUPEIN, D. D. S., Philadelphia, Pa.

Q. What is the system now used in the manufacture of excavators?

A. A system has, of late years, been introduced of making excavators, as well as nearly all styles of steel instruments, with socket handles.

Q. Is there any advantage in this system?

A. There are several advantages claimed for the system. The handles may be knurled in different patterns, whereby the operator learns to know the instrument he wants by the knurled handles, and not waste time in looking at the points for the instrument he needs. The knurled handles, besides affording a better and firmer grasp, are more elegant in appearance, giving a more tidy appearance to the instrument case than the old style round or octagon handle excavators. The *very best quality of steel* may be used for the socket points, which may not have been the case where the handle as well as the cutting blade were all made of one piece.

Q. Is the system applicable only to excavators?

A. No. By the employment of knurled handles of different sizes, chisels, scalers, pluggers, probes and explorers may all be fitted to socket handles.

Q. Is not the operator annoyed by these socket points loosening and coming out of the knurled handles?

A. Not often, for the manufacturers have provided plyers especially made to secure them firmly in the handles.

Q. Is the system useful in decreasing the number of instruments?

A. It is, for by having knurled handles, with *double sockets*, two socket points may be screwed into one handle, making it a double end instrument, and this is a special advantage in the use of right and left excavator points, and right and left plugger points. Indeed, much time may be saved the operator, by having his instruments arranged in this way, not alone for right or left instruments, but for other points which he may arrange to suit himself. Of course this arrangement would only apply when a filling would be inserted by *hand pressure;* should the electric, pneumatic, or mechanical mallet be used, only a single socket point could be used for each handle.

Q. What styles of excavators are of most service?

A. The Hatchet excavators of different angles; the Hook excavator; the Hoe excavator for scraping, and the right and left exca-

vators. With these and a few others nearly every cavity may be reached.

Q. What are excavators used for?

A. To remove the disorganized or decayed dentine from the cavity, and to give the cavity such a shape that the filling material which is used may not drop out.

Q. What should be the shape of the cavity?

A. It should be as nearly round as possible, and it should be slightly larger within than at the orifice.

Q. Is this rule absolute?

A. It is with some materials. But when using the phosphate of zinc filling material there is not the same necessity for making undercuts or making the cavity larger within than at the orifice, as the material adheres to the walls of the cavity. Also in the use of cohesive gold, the filling may be made to remain in place by the use of retaining pits.

Q. Are excavators the only instruments used for giving form to a cavity of decay in a tooth?

A. No, excavating burs used with the dental engine are extensively used for this purpose.

Q. What is the dental engine?

A. It is an instrument so constructed that foot power may be used to propel these burs, fixed in a hand piece, whereby a very accurate shape may be given to the cavity, at the expense of much less labor to the operator.

Q. Does not this instrument inflict more pain than the excavator?

A. It is doubtful whether it does or not. If used injudiciously it doubtlessly will, from the heat generated by the rapid revolution of the excavating bur; but if used intelligently it should inflict rather less than more.

Q. What is one of the most essential features of an excavator?

A. Sharpness; so that a good stone for keeping a keen edge to the blade is one of the most indispensable adjuncts of a dentist's outfit.

Q. Why is it that these instruments should be kept so sharp?

A. First, because a sharp instrument inflicts much less pain. Secondly, as the dentine is dense it requires sharp instruments to cut the cavity to the proper form.

Q. What kind of stones are best for imparting this keen edge?

A. Arkansas and Hindostan stones; probably the former, with a fine grit, is the better of the two.

Q. How should they be used?

A. The surface should be smeared with a film of oil and the instrument rubbed, on the stone, in the oil.

Q. Why should oil be used on it?

A. Because if oil be not used, the pores of the stone get filled with the steel that is ground from the instrument as it is rubbed against it, and after a time these pores will be so choked with steel that the stone will not cut any more. Even when used with oil, the stone should be wiped off clean after use. By proceeding in this way the stone will be kept in its best condition for service.

Q. What is the best form to be given to the blade of an excavator?

A. The blade should be rounding on its edge like a battle axe, not square like a chisel.

Q. Why is this form better?

A. Because they are more easily kept sharp, and it is probable that in this form less pain is inflicted while excavating.

Q. What is the first procedure towards forming a cavity to be filled?

A. All weak walls of enamel are to be broken or cut away with enamel chisels, and the cavity fairly opened.

Q. Should this be done prior or subsequent to the application of the rubber dam?

A. Prior to its application.

Q. Is this the only way of opening a cavity?

A. No, the cavity may be opened by means of small wheels, points and disks used in the dental engine.

Q. After the cavity is opened, what should be the next procedure?

A. The rubber should be applied. Then all weak edges of enamel should be cut away with *fine cut burs* in the handpiece of the dental engine. This should continue until the opaque or chalky condition of the enamel at the borders of the cavity is removed. The decayed or disorganized dentine should then be removed with excavators. When this is all removed the cavity should be shaped with excavators, or this may be done with excavating burs in the dental engine. All the chips which accumulate with these manipulations should be blown out of the cavity with a "*chip syringe*."

Q. What is a chip syringe?

A. It is a small metal pipe attached to a rubber bulb used for forcing air into a cavity, and thus dislodging the dust that accumulates from the cutting of the excavating bur.

Q. Does not this injection of cold air into the cavity give pain?

A. Sometimes it does.

Q. Are there no means of removing these cuttings of the bur which accumulate in the cavity except by the use of the chip syringe?

A. Yes; when this jet of air gives pain to the patient, the cavity can be swept out with a small camel hair pencil.

Q. Suppose this preparation of the cavity gives pain are there any means of preventing it?

A. It may be sometimes entirely prevented, and sometimes greatly mitigated.

Q. How is this done?

A. By the use of obtundants, and other means. Of the obtundants the chloride of zinc seems to be the most efficacious. This gives pain in its application, but the pain may be prevented by first moistening a pellet of cotton in carbolic acid, and then dipping this in some powdered muriate of cocaine. After this has remained in the cavity two minutes it may be removed, the cavity wiped out, and crystals of chloride of zinc applied, which often entirely removes the pain if left in the cavity two minutes more. Other operators rely upon sharp excavators and rapid cutting to overcome the pain. Others on dehydration by means of alcohol; others again by the freezing process with an atomizer and rhyoline sprayed into the cavity, and still others by means of the vapor of hot chloroform sprayed into the cavity with an appliance made for the purpose, and still others again by the use of carbolic acid, or the oil of cinnamon, placed in the cavity and evaporated therefrom by means of the hot air syringe.

Q. How should the borders of the cavity be left?

A. Strong, free from all rough edges, and free from all chalky or disorganized tissue. This may be accomplished with fine cut burs, or by means of sand-paper disks in the dental engine, prior to the introduction of the filling material.

Q. How should the cavity be shaped?

A. The walls of the cavity should be parallel, the bottom or floor of the cavity flat, or nearly so. The shape should be round or nearly so. The interior should be the same size as the orifice, or *slightly* larger.

Q. Can these always be accomplished?

A. No. It frequently happens that from the locality of the decay, the extent of the disorganization, the proximity of the pulp, etc, such a form cannot be given to a cavity.

Q. What then is to be done for the retention of the filling?

A. Undercuts, grooves and retaining pits have to be made in such places as not to encroach on the pulp.

Q. Are there other cases where such a form as you have described cannot be given to a cavity?

A. Yes. It is found sometimes that a cavity in the central part of the masticating surface of a molar will have several of the fissures radiating from it decayed, in which case the central cavity is prepared as described, while the fissures radiating from it are united in stellate form to the main cavity. It would not do to cut these fissures all out and make one layer cavity of it, but the fissures may be prepared and filled uniting these with the central cavity. But if there should be two or more cavities in the crown surface of a molar with only a thin septum of sound dentine between them, the two or three cavities should be cut into one large cavity rather than to prepare and fill each cavity separately.

[TO BE CONTINUED.]

SELECTED ARTICLES.

REPORT OF AN OPERATION,

BY DR. S. E. DAVENPORT, NEW YORK.

Dentists are occasionally called upon to treat mouths in which, while there is no particular tendency towards pyorrhea alveolaris, certain teeth, usually the lower incisors, will be found very loose, the bony process much absorbed, and the gum thickened and spongy, with perhaps a slight exudation of pus.

This condition in such mouths is usually of local origin, caused by the encroachment of salivary calculus, the other teeth in the mouth being ordinarily in very good condition and of unquestioned longevity, and it always seems sad to be obliged to advise the extraction of those loose teeth, particularly as it is difficult to replace them with artificial substitutes which shall be both comfortable and natural.

I will confess that on several occasions I have seriously considered the advisability of in some way fastening such teeth securely to the firm ones of the same jaw, for the sake of saving the patient the annoyance of a plate, although recognizing at the same time the many objections to all such plans.

On one occasion the temptation to attempt the retention of such teeth was increased by the pleadings of the patient, a gentleman about seventy years of age, in good health and of good physique, who had more than the usual horror of artificial teeth, assuring me that he would bear any fatigue and put up with any discomfort if I would but save his natural teeth.

The teeth had as usual elongated considerably, and when the jaws

were closed, the four inferior incisors would sometimes shut inside and sometimes outside the upper ones, though the roots were long and still had quite an attachment to the gum.

The first step was to grind down the elongated teeth with corundum stones until they would clear the upper ones when closed. This made the teeth very broad at the top, and enabled me to cut a rather deep longitudinal groove in the cutting-edges of not only the loose incisors but also the firm cuspids on each side, into which groove a small twenty-karat gold wire was fitted, filling about one-half the calibre of the groove.

At the next sitting, the rubber dam being first adjusted, the gold wire was secured to its position in the groove with zinc phosphate, which, when fully hard, was cut away from two teeth at a time, and replaced by semi-cohesive gold, malleted in, each tooth being held as firmly as possible with the thumb and fingers of the left hand while being worked upon. It was, of course, difficult to pack the gold as solidly around the wire in the loose teeth as in the two cuspids, but by looping the strips of gold over the wire from one side of the groove to the other, a very good adaptation was obtained, the fifteen-per-cent. platinized gold being used for the surface to give the greatest possible resistance to the forces of mastication.

The operation was successful in that the teeth were firmly held and made perfectly comfortable for the patient, who was instructed to use a small quill tooth-pick between the teeth after each meal, in addition to the usual thorough rinsing, so that the proximate surfaces might be kept clean.

At a subsequent sitting, the teeth were scaled and the gums treated, and within two weeks the discharge of pus had ceased, and the gums took on a healthy color and appearance.

This operation was performed in June, 1890, and was satisfactory in its results for just one year, when the gold around the wire in two of the incisors loosened. After new gold had been packed into those two teeth, I felt obliged to admit that the teeth could not be kept for any great length of time unless some additional protection could be given, as the strain from incising and masticating was too great for the strength which could be obtained.

An impression was accordingly taken, and upon the dies obtained a cap of pure gold, about No. 30, was swaged to fit the upper two-thirds of the lingual surfaces of the six teeth, and extending over the tops of the teeth to a point, perhaps, one-fourth of the distance down the labial surface.

This cap, being carefully fitted, was cemented to place, in June,

1891, with zinc phosphate, and the edges of the cap burnished to the teeth wherever possible.

This pure gold cap has become loose, I think, twice since it was first put on, but it is easily readjusted and has in every way fulfilled my expectations, for the teeth are preserved, and, I think, can be indefinitely.

Such a contrivance would be unsightly in a lad's mouth, but this gentleman, having a heavy moustache and beard, exhibits the golden line only when the joke is a particularly good one.

It would be a brave man indeed who would make a claim of originality for anything before this Society, and I will therefore say that I knew of the use by other dentists of this method for securing loose lower incisors years ago, so far as the gold wire and the strengthening fillings about it are concerned, but if the pure gold cap has been used by others I have never happened to hear of it.

DENTAL BOARDS.

PROF. J. FOSTER FLAGG.

There is an incentive to pass and graduate men who are utterly unfit. They come to us, they work with us, and they get around us in some way—I don't know how—and the result is that some young men who are utterly incompetent go out from our schools. Do we know it? They work hard; they are present at every lecture; they are in the seats with their eyes wide open and their mouths wide open, drinking it all in, poor as it is; we see them every day, and we get to known those boys, and we hope that when they come up for examination they will pass well. What do they do? They are required to make a set of artificial teeth, and they take an impression, which is a wretchedly poor impression; so they say to some fellow student who is able to take a good impression, "Here, I am going down stairs a minute; you just take this impression for me, and I will be right back." So the good man takes the impression. Then the poor man swages up a plate, and it is the poorest kind of work, and he gets another man to swage up the plate for him. He sets it in plaster, and where the single teeth are to go he sets them, but where a few teeth are to be ground up together he finds he can't grind them up, so he gets another man to grind up the gum teeth for him. And that piece of work is finally put in by this fellow as his work. He could not do it to save his soul; but how is the teacher to know that? Do you suppose we are going to watch every student at his work? Then, if a student has to prepare a cavity, and don't know how, he gets some-

body to do it for him. He can't put the gold in, so he gets some one else to do that; and perhaps he can't finish the filling, and he gets somebody else to finish it up for him. Finally, he brings it to my good friend here, or to me, and he is asked: "Did you do this work?" and he says, "Yes, sir," and he lays his hand on his heart. Then he comes up for examination, and we ask him questions. I would like to read to you, gentlemen, a list of some of the questions that I have asked the students who pass before me. If it don't take in the whole range, from A to Z, then I don't know anything about dentistry—that is, in my branch. I have no idea what they do in the other branches, but in my little branch of dentistry I examine students thoroughly, and I ask them questions that I doubt very much if many of my brother hornets could answer. We have forgotten the things we used to know in school, but we keep up with the procession pretty well in practice, and run dentistry decently well in our office. And so it goes on. This man comes up for examination and his finger-nails are written all over with the letters that he understands, and he gets beside some fellow that he knows is well posted, and he nudges him when a question is asked, and so, finally, he gets 41. He wants 42 That fellow, with all his cheating and defrauding, gets 41. And then I say, "Well, gentlemen, I voted 5 for that fellow; I think I can go one more. I will give him 6." Would not any one of you do that? I ask you, are you such hard-hearted cusses that you would not do that—particularly for your sons? Of course you will do it. You say, "He has worked hard, he is a reasonably good fellow, a thundering sight better than I was when I started in practice. I did not know one-tenth part as much when I started, so I can afford to give him one more." Thus he gets 42, and he passes. And he goes out and he says, "I guess I got about 59 out of them 60 votes."

Now, when my friend Dr. Osmun said, in speaking of the gentleman who failed to pass the Examination Board, that he came from a reputable college, where they taught those things *in extenso*, I at once assumed that it must be the Philadelphia College, because I would like to know where they teach things any more *in extenso* than they are taught in that college. If the students who go out from that college knew everything that is taught in it, they might rattle most of you old men.

There should be no controversy between our Examining Boards and the schools. If the students cheat us into believing they are fit to pass, they cheat themselves a hundred times more. What is the incentive? It is simply that, as a result of possessing our diploma,

they are enabled in many States to practice. If they could not practice under that diploma—if it only stated that these gentlemen have been sufficiently prepared to come before your Examining Boards and take your examination, that we have examined them and think they are capable of passing your examination easily—if these men, having passed our examination, could not practice till they had passed your Examining Boards, don't you suppose they would embrace the opportunities to learn what we give them? Don't you suppose they would learn how to prepare cavities, and take impressions, and swage plates, and grind teeth? Of course they would, because their right to practice would depend on their ability to demonstrate their knowledge of these things before you.

PREDISPOSING CAUSES OF DENTAL DECAY.

L. C. INGERSOLL, A.M., D.D.S., KEOKUK, IOWA.

Every tissue of the body has come to be what it is through various modifications of its typical nature, and has received an impress peculiarly its own, derived from a great variety of sources.

Amidst all modifications of typical forms and peculiarities of structure and function, we desire to learn to what extent pre-existing conditions are responsible for the exciting of decay.

Great steps forward in this direction has been taken in the demonstration of the fact that microorganisms are a potent factor in breaking down the hard tooth structures, but their work has been overestimated through failure to properly estimate the conditions that restrain their operation.

The chemical theory of the decomposition of the mineral portions of the teeth must be accepted from first to last of the process of decay, the only change apparent being in the source of acid supply; in the one case it is derived from decomposition of organic matter resting on the surface of the teeth, and in the other the acid is elaborated by bacteria. But why should it be thought necessary to abandon a theory of decay by vegetable and mineral acids chemically produced, when accepting the theory of decay by acids produced by organic germs? It is chemical decomposition in either case, with the additional destructive work of the bacteria gaining their food supply by devouring a portion of the organic matters composing, in part, the substance of the teeth.

From what we know of the agencies that destroy human teeth, it is certain that their presence is a sure prophecy of tooth destruction? Are there any pre-existing conditions and tendencies that restrain

active causes? Are these favoring or restraining influences inherent in the nature of tooth-structure, or are they accidental or artificial?

Disease is from without; antagonism to disease is from within, and the strength of the antagonism depends on the nature or functions of the tissue or organ. The fact that organic substances do not exhibit the same antagonizing resistance in the presence of destructive influence from without is evidence of a difference of elimentary constituents. While the greatest of the difference is created by vitality, which resists chemical decomposition, there is, wholly independent of life, a great difference in the material structure which invites decay. Because of this difference of material composition, one substance decays, while in the same condition and subject to the same influence another does not decay.

Such facts lead us to conclude that the etiology of dental decay is not alone in external influences, but also in the inherent nature of tooth substance.

When the favoring and restraining conditions of dental decay are compared, it will be found that the latter far outnumber the former, and are far more impotent in their influence. We find individuals in whose mouth the conditions favoring decay—the so called predisposing causes—are so overmatched by resisting and restraining conditions, the decay of the teeth is prevented. This is in harmony with the philosophy of life and the demand of physiological functions. This is nature's self defense against destruction, a sure cure for dental decay. Antisepticism is not a cure; prophylaxis is.

Here there meets us the grandest theme ever presented in dental literature, the prevention of dental decay. Not that prevention which arrests decay when its work of destruction is half done; but that prevention which does not allow the work of decay to begin; that prevention which establishes by hygienic law a barrier in the very nature of tooth substance that will effectually resist all external influences; that prevention which reaches back to embryonic life, and stamps with longevity the protoplasmic germ.

We need a better understanding of that dental hygiene that guards the very portals of life and nutrition, and forbids the entrance into the tissues of the teeth of every element of weakness and decay.

Then we may expect that teeth will bear on their faces the monumental records of a comfortable and happy old age.

No abilities, however splendid, can command success without labor and persevering application.—A. T. Stewart.

A BRIEF HISTORY OF ANÆSTHESIA.*

One of the most brilliant events in the history of dentistry is the advent of anæsthesia. What discovery or invention is comparable to this, by which "the knife of the surgeon is steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony is forever smoothed away?" to quote the poetic words of the venerable, but still youthful author of the term anæsthesia, Oliver Wendell Holmes. While there has been an ether controversy, there cannot be an anæsthesia controversy. The ether controversy was waged with great earnestness and bitterness, but with the lapse of time and the removal of those directly interested, the credit is now generally given to the late Dr. Morton, a dentist of Boston, He it was who took his life in his hands, and, with sublime courage or audacity, put in jeopardy human life to solve the problem of anæsthesia with ether. He traveled in darkness an unknown road; he succeeded and demonstrated to a skeptical world anæsthesia by etherization. The Massachusetts General Hospital justly and elegantly expressed the sentiment of mankind, in its inscription on the present given him, in the words: "He has become poor in a cause which has made the world his debtor."

Without detracting from the great honor due to Dr. Morton, greater honor is due to another dentist. For it is true, and is now being admitted, that Dr. Morton but traveled in another path, though further than had been traveled two years before to his own knowledge, by the true and original discoverer of anæsthesia, from whom he derived his incentive, the late able, but less persevering and obstacle-overcoming dentist of Hartford, Dr. Horace Wells.

If we grant that the whole includes all parts, though one part may be so brilliant as to overshadow the others; if we grant that an inventor of something entirely new is entitled to credit superior to him who invents an improvement or modification, even though the latter may be better; if we grant that the discoverer of a great truth or principle in nature is greater than the one who, following in the same lines, by using other agents or methods, more fully or successfully demonstrates the truth or principal—we must admit that the greater honor is due to Dr. Wells—provided it is true that, in 1844, two years previous to Dr. Morton's discovery, Dr. Wells did intelligently and publicly, with full appreciation of the phenomena, perform painless operations in dentistry and surgery by the administra-

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*Extracts from Dr. L. D. Shepard's Address before the Columbian Dental Congress.

tion of nitrous oxide gas, given for that specific purpose. I think that history bearing this out is too explicit, too minute, and too reliable to render this statement debatable.

The discovery of the efficacy of chloroform in 1847, and its rapid spread over Europe to the almost total exclusion of ether, gave such fame to its discoverer, Dr. Simpson, afterward Sir James Y. Simpson, that for many years in Europe he was generally reputed to be the discoverer of anæsthesia.

Ether and nitrous oxide gas had the field almost exclusively for about fifteen years, till the revival of nitrous oxide in 1862, so that most naturally the agent used and the resulting anesthesia became synonymous terms in the general understanding. It is not strange that the neglected and forgotten nitrous oxide during this long period should have had as companion in its oblivion the name and fame of Horace Wells. But its revival in 1862, and its general and successful adoption throughout the world, demonstrates that it is second to no other agent, and proves that its short use, before ether eclipsed it, was due to fortuitous circumstances in no way detracting from the merit rightfully belonging to the diffident, sensitive, generous and noble man, who so soon after, disappointed and with unsettled intellect, met his tragic death, but whose memory is still green in the field of his labors and in the hearts of his fellow-citizens.

While in the following decade, 1850 to 1860, colleges, magazines and associations multiplied and jointly contributed to bring the profession more and more in touch with progressive thoughts and truths, the most distinctive discovery of the decade, and most momentous in its influence, was that property of gold, which, previously considered detrimental, was now to be welcomed as its most valuable characteristic—cohesion.

The introduction of crystal gold and the discovery of the cohesiveness of freshly annealed foil laid the foundation for the new era in operative dentistry. Let us never forget that while others claimed the latter discovery, and doubtless had known of it and availed themselves of it for some time, Dr. Robert Arthur lost no time in freely sharing his discovery, as soon as made, with the whole profession. He thus achieved a distinction of which others have never been able to deprive him.

The descriptions and illustrations of operations with crystal gold in the essay of that venerable and respected Nestor, still with us, Dr. W. H. Dwinelle, published in 1855, might still answer for an essay of to-day. Here was the renaissance of operative dentistry.

Here was the dawn of the new era of restoration ; the parting line between antique mutilation and disfiguration, and the subsequent devotion to beauty and typal form. It was the first great advance in practice. It was but natural that it should be supplemented by improved instruments, the mallet, the rubber dam and the engine. How great a revolution has resulted from these instruments and appliances none can fully realize, except those of us who have been long enough in practice to remember the struggles necessary in the old era. However radical and conservative are the views we hold to-day, there can be no question of the tremendous shaking up of the profession in its thoughts and practice which resulted from these innovations.

While most of the appliances just mentioned came in during the decade 1860 to 1870, they do not constitute, it seems to me, the distinctive advance of that decade. There had been a disease of the mouth, which up to this time had been recognized or regarded universally as incurable. It had from a remote period been described in the books as scurvy of the gums, or some such term, and had been treated only by washes or medication It was considered inevitable and irremediable that sound teeth should be lost, self-extracted. A prophet arose who taught that such deplorable conditions were always preventable if taken in time, and frequently remediable by surgical treatment when the disease had made quite extensive inroads. He was received as prophets usually are, except by a few who early became his disciples. He was not a profound physiologist or pathologist, and did not present a theory or description which met the approval of experts ; but he had lived many years, was a man of observation and reflection, and while not scholastic or correct on every point, his observations had been clear and his deductions in the main correct, so that the treatment which he was first to bring out and demonstrate is even at this day, after so many of our best pathologists have devoted much time to the study of the disease, accepted as the foundation of all treatment.

The men who knew him, saw him operate, were taught by him, and were successful in following his methods, were wont to call the disease after his name. This was not correct, we know, for he originated only a treatment and did not describe a disease ; but the fact remains, and there are enough living to testify to it, that as a result of his life and efforts, of the seed which he planted, a dire disease has been robbed of its terrors, the profession has been stimulated throughout the world to study its etiology and progress, and the premature

loss of teeth from this disease is no longer considered providential or respectable.

While operative dentistry has continued to ride constantly on a flood-tide of progress and improvement, prosthetic dentistry has had its ebbs and flows. Sixty years ago the great mass of the profession were unskilled as operators, but fairly skilled as plate workers. They could not save teeth, but they could replace their loss. In plate work the culmination of prosthetic skill and artistic production came with the invention and perfection of porcelain or continuous gum. After the introduction of vulcanite, the general disuse of metals made laboratory skill of little value, and hence it was neglected or ignored in the preparatory training of the student. The manufacturers supplied a great variety of instruments, so that the forging, shaping and tempering of instruments became almost a lost art. The ease and facility of working of vulcanite not only called for little ingenuity and skill, but so obliterated the distinctions that the novice, after a few weeks of instruction and practice, could compete with the most experienced, and this important and most beneficial branch became the refuge and ally of incompetence and quackery. The evils resulting from the wholesale extraction of good teeth are deplorable and cannot be estimated.

The increase in the number and the constant elevation of the standards of the college year by year, raised the ratio of the educated; the periodical literature was more generally taken and read; societies multiplied and did most valiant missionary work; Codes of Ethics were adopted and enforced; laws were passed for the protection of society, which, while licensing all in practice to continue practicing, irrespective of their knowledge or skill, raised a barrier against their admission to practice of the ignorant and incompetent. From all of these and other causes the tone of the profession was gradually raised, and juster and broader views of what was right and best for the patient became more prevalent.

But the cause more important than any or perhaps all of the foregoing for the increase of laboratory skill and the retention of teeth and roots is to be found in the invention of the modern artificial crown and its corollary, the bridge.

This is the distinctive improvement of the past twenty years. Within that period more than one hundred different crowns and bridges have been invented.

The result has been twofold. It has made laboratory skill of more importance and value to the dentist than ever before, and it has ar-

rested the great "slaughter of the innocents" by making the retention of the roots of teeth in the mouth obligatory.

At various periods the separation of the two branches of practice has been urged by prominent men of each branch, but by these inventions the two branches have been bound together in bonds which seem indissoluble.

The chief drawback to perfection in the past has been the inability of our art, however skilful, to permanently save some teeth. The inherent defects of structure or of surroundings made the best operations but temporary, and these teeth had ultimately to be lost and substitutes applied. Now, after all the worst has happened, the root is still of inestimable value for crowning. This invention seems to place a climax on our art.

In recent years there has been an increasing interest in the deeper causes of physiological function and of pathological departure from normality. Histological investigations have been pursued with great enthusiasm and thoroughness, and the advances in other departments of microscopic research are largely due to methods which were first devised and employed in the study of dental tissues by ingenious dental microscopists. These fields of research are inviting to the student, but demand great courage and self-denial when cultivated by those whose labors are severe and fatiguing in the daily routine of the office. We rejoice that there are so many dentists throughout the world who are devoting their energies, after the day's work is done, to these problems.

How crude and speculative seem the theories of dental caries which obtained less than a score of years ago when contrasted with the brilliant demonstrations of the renowned American professor of Berlin, founded on patient and protracted investigation after the most improved modern scientific methods. Though from unavoidable circumstances detained at home, he has shown his interest and cooperation by forwarding a paper. There are many others whose fame is not bounded by their vocation or their country. They are known to the world as scientists and cosmopolitans. However skilful and judicious a dentist may be as an operator, this sphere of his usefulness is limited in space and not far-reaching while these men are working for mankind at large and for succeeding generations.

Let us not grudge explorers of the unknown their only recompense, the meed of praise and applause for what they have done and will do for the profession and for humanity.

ADVICE TO THE OFFICE BOY.

Be the first at the office in the morning, and the last to leave in the evening. Don't have your hat ready to snap up, or to fidgit with anxiety to leave as the hands of the clock point to the hour of closing. Never fear an extra hour's work.

Whatever is given you to do, no matter how trifling, do it thoroughly. Let not the slightest trace of blood or accumulation remain on the instrument given you to clean and sterilize.

Be at hand for every call of your employer. If a patient call, learn if possible the name and address, as well as the purport of the call, whether for a service or for an appointment, this of course without making yourself obtrusive.

Always keep employed. If there be no assistance needed by your employer, clean the workshop, the lathe, the impression cups, see that materials needed are not entirely run out before making a fresh supply.

Don't play, don't fool, don't read dime novels in the office or laboratory. Employ your spare time at things better than these. These things are not what you are employed for or paid for.

If sent on an errand return as soon as possible, you may be wanted and your return anxiously awaited. When thus sent out do not loiter on the streets, looking in windows, or listening to street peddler's harangues.

Ask for leave of absence only when a real necessity compels you, such as sickness or death at home, or other serious trouble.

Don't eat during business hours either in the office or laboratory, nor come into the presence of your employer or his patients picking your teeth or chewing a tooth-pick. These actions savor of familiarity and disrespect.

Always say "Good morning" or "Good evening" when you come in the morning or leave at night, as politeness is always appreciated.

Don't cut out pictures from the newspapers or comic journals and paste them over the laboratory walls.

If your mother sends you to bed early don't sulk. She is the best judge, and a good long night's rest better prepares you for the next day's work. Young people require all the sleep they can get.

Be truthful! Don't think that "a little lie" will do no harm. The prevarication will always be found out and will tell against you. From "a little lie" you will contract the habit of direct falsehood, and "a liar" is first cousin to "a thief." Liars, small or large, never make a

success in life. Stick to the truth always, and you will never loose by it, but rather gain by it, and be able to look every one in the face.

Keep your boy friends away from the office. They have no business there, and you have no right to have them there. Your employer pays you to receive *his* callers—not *yours*.

Be polite to everybody—to the peddler, the book agent, the dental supply man, and learn if your employer wishes to see either before dismissing them. Politeness costs nothing, and is more valuable and more acceptable than many things which cost much.

Do your best in everything that is entrusted to you.—*Home Journal.*

THE PRACTICAL PLACE.

How to Make Lower Plates Suck.

I am asked to be more specific than in a former article. Now then :

Get a perfect impression with the parts in their normal shape. This may take personal showing; it certainly takes considerable experience, and always the greatest care.

Make a model of uniform density, smooth and glossy on its surface, and so hard you can't drive a common brass pin into it. This takes the greatest care, but it can be done with experience and first rate plaster, and in difficult cases it is absolutely essential.

Flask with pressure so light as not to force the model out of shape. Vulcanize thoroughly at lowest temperature, and give your case from four to six hours to cool off slowly, that your plate may not warp from imperfect crystalization.

Trim the plate so its dull, well-rounded edges don't bear more on the side muscles than on covered parts, nor press too hard on them. Nothing in all dentistry requires better judgment, more experience or greater care than trimming a plate rightly. In lower plates see that your edges are blunt, well rounded from both sides, and smooth.

See that your articulation is perfect, the bicuspids and molars all "occluding" at the same time, under light pressure. Don't force an articulation by hard biting. The anterior teeth should hardly touch.

Those described some time ago by Dr. Haskell, where the cheek muscles are higher than the alveolar rim, the lower plate should be of molded metal, made with the care essential in that kind of work.

Now, boys (I say boys, for the old dentists know all this, but won't tell it), if these instructions are perfectly carried out in detail, step by step, any lower plate will have some suction, and most of them

will stick as well as other plates of equal areal contact. But a failure in any step may, and in unfavorable cases will, spoil all.

All this requires capabilities and time that will bring you above competition in charges with the bunglers, and botchers, and cheap Johns, that constitute largely the profession in mechanical dentistry. (Excuse me from the words "prosthetic" and "denture.")

In such work you must take things thoughtfully, coolly, slowly and carefully—no "eight plates a day." One plate a day is enough for an old fogy like me; but when I'm done she can test her teeth with dried beef to her hearts content, before she pays for it.

—Dr. J. H. Greene.

They say: That thymol, locally applied in the hollow of a tooth, is a relief for toothache.

That chloral hydrate in hair tonics relieves dandruff.

That hot water relieves delirium tremens—distills the alcohol out, as it were.—*Pacific Druggist.*

Mosquito Bites.

A correspondent writes to the New York *Tribune* that an effectual and speedy cure for mosquito bites is aristol (powder). The tip of the finger is moistened with water and a little of the powder taken and rubbed on the inflamed spot. The powder imported from Germany is considered the best.

The key to success in any department of life, is self-denial. Idleness, laziness, wastefulness, come from lack of it; while industry, promptitude, economy, thrift and a successful career are the result of it.—Neal Dow.

Try to find out the business for which you are best adapted, and stick to that one thing. A young man should have a real love, amounting to a passion, for his calling.

Cologne Water for Colds.

Dr. Roux recently addressed the Medical Society of Lyons in favor of the use of eau de Cologne as a remedy in incipient coughs and colds. A number of patients having been able to stay colds in twenty-four hours by inhaling eau de Cologne from a pocket handkerchief through the nostrils or mouth, according as the part affected is

in the chest or head. A disagreeable burning sensation is experienced at first, but this soon passes away.

HEALTH AND HYGIENE.

HOW TO TAKE A LUNG BATH.

Did you ever hold a watch and see for how many seconds you could keep a stream of air flowing into your lungs? If not, make the test, and you will find that, no matter how small the stream, you cannot keep it constantly flowing in for more than fifteen, twenty, or possibly thirty seconds; but if you will try two or three times each day you can double the time within two weeks. The boy or girl who will try this and keep it up regularly for a year will not be likely to die of consumption, and should they ever become public speakers or singers they will be very thankful that they commenced when young to take "lung baths." Harper's Young People, in speaking about breathing, says: Did you ever think of taking a lung bath? One's lungs needs cleansing as surely as do the hands and face. This is especially true after one has been in a crowded hall or church, breathing in so many impurities. How can one take a lung bath? By simply drawing a deep breath and then expelling the air from your lungs. You will feel wonderfully refreshed thereby, and the general health will be improved.

KEEP THE SHOES DRY.

Keeping the feet dry is of quite as much importance in summer as in winter, though many persons do not seem to realize this.

In the heavy dews of morning and evening the shoes get damp and suffer seriously, even though the health may not. It is worth while to keep a strict lookout as to the coverings of little feet. When they come off at night it is well to have an old stocking full of dry oats or beans. Put these into the shoes, tie a string around the stocking just at the ankle, and set the shoes away for the night. The grain will not only draw out all the moisture from the leather, but will keep the shoes in shape without allowing them to shrink.

Rubber boots for men and boys may be filled with beans or oats and dried out when all other means have failed. There is nothing more uncomfortable than to put on damp and soggy shoe leather, and with forethought and precaution it is entirely unnecessary.—*Ledger*.

COFFEE FOR BILIOUS PEOPLE.

Dr. Samuel Elliott says of a number of experiments in diet, tried at his hospital: "We speedily found that patients in hospitals and all

persons leading a sedentary life must avoid too concentrated food content themselves with less variety, and drink abundantly of diluent fluids , that coffee acted upon the liver and was altogether the best remedy for constipation and what is called a bilious condition ; that tea acted precisely in an opposite direction, namely, as an astringent; that not popies, nor mandragora, nor all the drowsy syrups of the East could bring the peace to a sufferer from malarial chill that would come of strong coffee with a little lemon juice added ; that strong tea was almost a specific for neuralgia in its simple, uncomplicated form, while turnips were found to be almost a specific in the simpler types of rheumatism common to young men, where the only predisposing cause was exposure to the elements."

Some recent experiments in Germany confirm the opinion of physicians that the coffee which is an aid to digestion must be an infusion and not boiled. For this particular reason the after-dinner coffee should always be an infusion. The caffeine of coffee, however, which is the element most stimulating to travelers, is said to be drawn out by keeping the coffee at the boiling point for a few minutes.

TREATMENT OF DIPHTHERIA.

An observant and thoughtful country doctor in the French village of Neuville-Champ d'Oisel, about nine miles from Rouen, made an important experiment last year, which may be the means of saving many lives, if the knowledge of it comes to be widely diffused. A violent epidemic of diphtheria broke out, and the deaths were appallingly numerous, and his usual methods of treatment seemed a total failure. He remembered that the English had used petroleum (kerosene) as an antispasmodic and antiseptic ; he determined to try it on a little girl of 7, whom he had given up. He explained to the parents that, with their consent, he would make the experiment, and at once commenced swabbing the throat with the petroleum. He was careful not to have an excess of the material on his brush, as a drop too much might strangle in the disabled condition of the throat and larnyx. To his astonishment there was improvement after the first application. He continued the treatment, and the child recovered ; and he used it successfully with many patients afterwards—in fact, he lost none.

Lest this should turn out to be too good news to be true, and it should prove that he had been treating false diphtheria, which so closely resembles the true that only examination by an expert bacteriologist can determine its nature, he sent portions of the expectorated membrane to Professor Francois Hue, bacteriologist of

the Medical College of Rouen, and he reported the presence of numerous bacilli of diphtheria.

A little observation and reflection show how the potent fluid works. The membrane of diphtheria consists of a most rapidly-growing plant, and among the other elements in petroleum is a large amount of sulphur, which is very inimical to diphtheria membrane. Did you ever notice how effectually a handful of common salt will kill a tuft of thrifty grass? There is something in this oil that is just as fatal to the diphtheria plant; at once the membrane seems to become thinner, *i. e.*, it ceases to grow, and that which had attained its growth breaks down under the softening of the oil, and eventually disappears.

We are thus careful in detailing the use of this remedy, for supposing a person, far from a physician, is attacked with some malady which produces "white spots on the throat." Whether it is false or true diphtheria, it is an undesirable inmate, very liable to be communicated to others, for it only wants a throat slightly inflamed by a cold to find its natural habitat—a soil where it will thrive.

Of course, the family has kerosene in the house, and a bit of soft old cloth wrapped about a smooth stick will answer in the absence of the camel's hair brush always recommended in regulation articles on applications to surfaces; the point is to get that oil on to the white spots and kill the bacterial growth then and there. The operation should be repeated once an hour. The careful ridding of the brush or swab of any superfluous drop prevents choking.

The person applying the oil should be careful to stand a little at the side, so that should the patient cough, no particle of the expectorated material can get into the eye of the operator, as the human eye is of all culture mediums for diphtheria bacilli about the most favorable, and to-day many a lost eye is owing to want of carefulness. It is said that the patients experience relief at the first application, and if the brush is properly shaken before using, the only discomfort they experience is a disagreeable taste for a short time.

We wish that a warning word might make people more vigilant as to the care to keep the disease confined to the original sufferer. Among the ignorant and poor, where comforts are scarce, it is spread by using the same handkerchief for the sick and well, allowing them all to drink from the same glass, etc.

A German family of five children were swept off within nine days by simple carelessness in these matters, but let every one remember that diphtheria is the most easily communicated of all the "catching" diseases, that its period of incubation is very short, not generally

more than two days, and that it fastens on the very gates of life—the breathing apparatus—and that it is one of the most rapidly progressive of maladies. No harm can come of the use of the remedy above recommended, and its prompt use may save some precious life.—*New York Independent.*

INSANITY FROM TEA DRINKING.

In a report upon insanity in Ireland, recently issued, attention is called to the immoderate use of tea as a cause of mental disease among the poorer classes. "While the moderate use properly-prepared tea," the report states, "is regarded as innocuous, or even beneficial, in its action on the nervous system, its ill effects, when decocted or over-infused, on persons who make it their staple article of dietary, are dwelt upon by almost all the resident medical superintendents in their several reports. Undoubtedly, the method of preparation adopted, and the excessive use of this article of diet, now so general among our poorer population, tends to the production of dyspepsia, which in its turn leads to states of mental depression highly favorable to the production of various forms of neurotic disturbance." The tea used is generally of an inferior quality, and the method of preparation is to put a quantity in the teapot early in the morning, and to allow it to stew during the day, water being added as required. The excessive use of tobacco, also, especially among the young, is thought to contribute in a minor degree to swell the statistics of mental failure.—*Medical Record.*

WHAT is a remedy for a sty?—E. H.

Take one-twelfth of a grain of the sulphide of calcium every six hours.

FUSIBLE METAL.

A mixture of lead 5, tin 3, and bismuth 8 parts will melt at 92° C. Another formula is lead 2, tin 1, and bismuth 3 parts.

DEVITALIZATION OF HIGHLY INFLAMED PULP.

Dr. Jas. Trueman says: I have most satisfactory results from the use of iodoform in small quantities in connection with arsenic. So far as tried, there has not been a partical of pain in acute pulpitis.

FUNCTIONS OF THE FIRST PERMANENT MOLAR.

An important function of the first permanent molar is that of fixing the bite. Erupted at a time antedating any of the other permanent teeth, by the time the bicuspidati are erupted, it is fully formed and

fixed, a bulwark against the forcing backward of the anterior teeth, and holding the maxillæ apart, so that there will be no interference with the proper eruption of the incisors. Interference (unwise) or removal before the eruption of the bicuspidati, permits aberrations in the anterior articulation. Regulating caps, worn as a means of holding apart the jaws in regulating teeth, tend to shorten the exposed portion of its course and produce, in a less degree, the same effects. If the cuspidati are the keys of the arch, the first molars are the pillars.—HENRY BURCHARD.

SCIENCE.

Ordinary table salt is a chemical compound of chlorine gas and the metal sodium. Sodium, and potassium, another metal very much like it, are very abundant in combination with other substances, but are rare and expensive in the metallic state. When pure they are whitish metals somewhat like silver, very light and very soft. One of their most interesting properties is their conduct toward water, which makes it necessary to keep them in petroleum, or some other liquid for which they have no attraction, to protect them from the moisture in the atmosphere. If you throw a piece of one of them in water it will hiss and splutter around violently, and appear to be on fire. The reason is that they have a strong tendency to decompose water, which, as you know, is a combination of oxygen and hydrogen gases. These metals unite with the oxygen and part of the hydrogen to form what we call caustic potash of soda, and part of the hydrogen is set free, The free hydrogen is set on fire by the heat produced by the chemical action. It looks rather queer to see water set anything on fire, as it appears to do in this case. A laboratory boy in one of our universities one day saw a piece of sodium which had been carelessly left on the lecture table. On taking it up in his wet hands it blazed up and burnt him. He naturally threw it in a vessel of water to put out the fire. When it struck the water a little explosion followed, and several bits of sodium flew in his face and burnt him severely. There never was a more surprised boy, and it will be a long time before he forgets that water will not always put out fire.

Even more absurd than the idea of water setting anything on fire seems the idea of freezing water in a red-hot vessel, but it has been done. If you pour some water on a very hot piece of metal it will break up into round drops, which will run in all directions. When the metal becomes colder these drops will suddenly explode into steam. The reason is that a thin cushion of steam is formed under the water and protects it from the heat, since steam is a vary bad

conductor of heat. As the water does not touch the metal, its surface extension makes it take a spherical shape. As the metal cools down the layer of steam disappears and all the water suddenly comes in contact with the metal and is at once turned into steam. The water is now said to be in the spheroidal state. You can prove that it does not touch the hot metal by putting a candle behind it for you can see the light between the metal and the drop. The temperature of the drop can be easily measured with a small themopile, and will always be found to be below the boiling point. Now you can see how water can be frozen in a red-hot vessel. When sulphur is burned it unites with oxygen and forms the disagreeable gas used in fumigating, called sulphurous oxide. By cold and pressure this gas can be reduced to a liquid, and if some is poured on a hot surface it will assumes the spheroidal state, with a temperature of about eleven degrees centigrade below the freezing point of water. If we pour some of this liquid in a platinum crucible heated red hot and add a small quantity of water, the two liquids will be protected from the heat by the cushion of vapor under them, and the intense cold of the sulphurous oxide will freez the water, and by quickly throwing it out a small piece of ice may be obtained. If you wet yonr hand you can safely dip it in melted lead or iron for a very short time for the steam will protect it.

Chapped Hands and Face.

An excellent remedy for chapped hands and face, and one that, if properly used, is said by Spratling to cure the most painful cases in from twelve to twenty-four hours, is compounded as follows :

Compound tincture of benzoin	10 mins.
Alcohol	2 drs.
Rose water	30 mins.
Glycerin	1 oz.

Apply to chapped surfaces at night, after they have been washed with soap and warm water, and thoroughly dried.

This remedy is also used in the treatment of fissured, bleeding or sore lips.

The Art of Thinking.

In writing upon the subject of thinking and reading, Dr. T. B. Welch says truly, that it is easy and entertaining to read an article which tells you something which you knew before and which you can endorse, but you learn nothing by reading it. It often requires an effort to read an article which contains real information, however

plainly expressed. It has to be studied, applied digested, criticised; the suggestions raised by its perusal have to be followed out to their conclusions; and to conscientiously read an article of this character is a task which some men are inclined to shirk, just as a lazy man might shirk a physical task. But compare the man who shirks with the man who reads, and you will find the first a mental bungler, the second the acute and able thinker, the man whose head saves his hands, and who is valued, respected, and trusted with the conduct of work and administration of affairs, and rewarded accordingly. Always read a little ahead of yourself. Read matter which requires effort on your part to understand. The effort will not only place you on a higher intellectual plane, but the mental exercise will develop a habit of accurate thinking which will be of more value to you than volumes of average matter read only to be forgotten.—*International.*

Glue Not Affected by Moisture.

Glue that will resist moisture is said to be easily prepared as follows: Water is poured over ordinary good glue, which is then allowed to stand for a while, but not long enough to become gelatinous. Linseed oil is poured over the mass, which is heated over a slow fire until completely dissolved, when it is ready for use. This glue becomes exceedingly hard after drying.

Trichloracetic Acid.

I am specially pleased to report, so far as my experience goes, that we have in trichloracetic acid an unequaled remedy for apthous stomatitis or canker sore mouth. These mucous patches are often quite painful, and annoying to both patient and operator. Ordinarily, one or two applications will be sufficient. In extensive cases, patients may be given a small bottle, and apply it for themselves. It seems to me that we can do the medical profession no better service than to call their attention to this remedy as a "specific" in this class of lesions. One application is sufficient to stop further progress, if used on first appearance of the lesion. I say this with considerable confidence, because I have succeeded where the physician has failed.—J. A. Dunn.

Trichloracetic Acid is finding many uses in our work. In raw sore patches on the lips or in the mouth a little touch of it will relieve pain and soreness, and a few applications will cure. If in filling a cavity to or below the gum there is weeping that keeps the cavity wet, touch the gum with trichloracetic acid, and there is no further

trouble. In scaling the teeth below the gum sometimes we have such excessive bleeding we cannot do our work well, especially if there is pyorrhea, but a little of this acid will clear away the pus, staunch the blood, reduce the congestion of the gum, and cause the accretions on the teeth to crumble. It is often effectual in reducing hypersensitiveness of the teeth, both of the dentine, in excavating a cavity, and on the surface of teeth. But sometimes the very opposite of any acid is required, a strong alkali such as Robinson's remedy should be applied. The trichloracetic acid should not always be used in full strength. A 10 per cent. solution is sometimes preferable.

Sodium Peroxid Solution.

The successful use of sodium peroxid as a bleaching and sterilizing agent depends on the care exercised in making the solution of it. If the solution be made hurriedly by the addition of considerable quantities of the powder to the water at one time, the evolution of heat, due to the energy which attends the combination, produces a rapid elevation of the temperature of the solution. This causes a decomposition of the peroxide, a loss of its loosely combined extra atom of oxygen occurs, and the resulting solution is little more than a solution of sodium hydrate or ordinary caustic soda, which is practically inert as far as bleaching power is concerned. To obviate the rise of temperature and consequent decomposition of the peroxid, the solution must be made slowly, and the vessel in which it is made should be surrounded by ice-water or some cooling mixture; or the solution can be made by gradually dropping the powder on the surface of a piece of ice about the size of a chestnut, contained in a small breaker of about one-ounce capacity. Dr. F. T. Van Woert, who has had an extended and satisfactory experience with sodium peroxid as a bleaching and sterilizing agent, kindly furnishes, for the benefit of *Cosmos* readers, the following detailed account of his method of preparing the solution:

"To the Editor of the Dental Cosmos.

"Sir:—I find, after many experiments, that the most satisfactory solution of sodium peroxid is obtained in the following manner: Take a common tumbler about half full of distilled water, place it in the centre of a good-sized pudding-dish, and pour all the cold water around it possible, without floating the glass. Add the sodium peroxid in very small portions—about what could be taken on the point of the large blade of a pocket-knife—dusting it into the water slowly to cause as little agitation as possible, and this amount should

not be added oftener than once in a half-hour, being careful to have the sodium peroxid finely powdered. This to be continued till the preparation begins to look opaque as powder is added. Let it stand over night, and it is then ready for us. If a lump about the size of a small bean is dropped into water, you will notice on the margin of the line of agitation a ring of color resembling iodin. A solution made in this way has always proven useless to me. If the peroxid is put in the water as I have suggested, there will be very little surface agitation, and none of the discoloration, the result of which is a solution that has never failed. This takes several days to make, but it will more than pay for the time consumed, in its prompt action as a bleacher and sterilizer I have placed this solution in the hands of a number of gentlemen, to be used in the treatment of abscessed roots, and to the writing of this not a single failure has been reported. The general impression is that sodium peroxid is for bleaching only, while it is the most valuable preparation ever found for the treatment of dead teeth, if used in the following manner: Cleanse the root canals of such septic matter as possible to get at with instruments, and dry them with hot air; then carry small ropes of cotton, saturated with a full strength solution, as near the foramen as you can, using orange-wood shaped like fine probes, and cover with a temporary stopping, letting the whole remain for two days, after which wash with hot water, and fill in the usual manner."—F. T. Van Woert.

Restoration of Hardened Rubber.

It is said that rubber goods which have become hardened by age may be restored to almost the original softness by simply soaking in a water of ammonia diluted with twice its bulk of fresh water; and that this does not injure the rubber in any way, and restores the elasticity. Usually soaking from ten minutes to half an hour is quite sufficient. After drying the whiteness may be restored by dusting well with chalk or kaolin.

OBITUARY.

Dr. Richard B. Winder died at Baltimore, Md., on July 18th, 1894, having attained the seventy-sixth year of his age. Dr. Winder was a Virginian by birth, and commenced the practice of dentistry in his forty-first year. He was for many years dean of the Baltimore College of Dental Surgery, and labored solicitously to uphold the dignity of the dental profession against the levelling efforts of the Census Bureau. He has always been regarded as a good amiable man and a conscientious dentist.

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